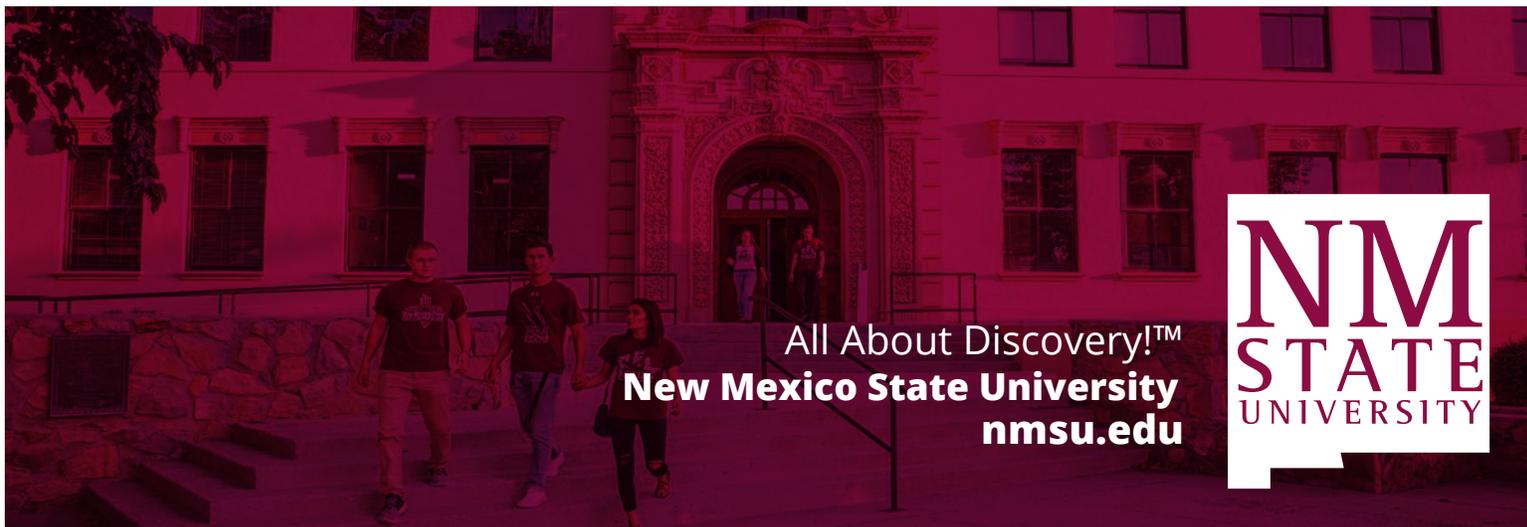


# NEW MEXICO STATE UNIVERSITY

ACADEMIC CATALOG  
2018-2019



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# TABLE OF CONTENTS

Las Cruces Academic Catalog .....	10	Agricultural and Natural Resource Leadership - Undergraduate Minor .....	91
University Leadership .....	11	Agricultural and Extension Education - Master of Arts .....	91
The History of the University .....	12	Agricultural and Extension Education - Graduate Minor .....	91
Programs A-Z .....	13	International Agricultural Development and Extension - Graduate Minor .....	91
Areas of Interest .....	18	Agricultural Economics and Agricultural Business .....	91
Applied and Clinical Health Sciences .....	18	Agricultural Economics and Business - Bachelor of Science in Agriculture .....	96
Applied Social and Behavioral Sciences .....	18	Natural Resource Economics and Policy - Bachelor of Science in Agriculture .....	97
Business .....	18	Agricultural Business Management- Undergraduate Minor .....	97
Communication, Media Study, and Creative Arts .....	18	Natural Resource Economics- Undergraduate Minor .....	98
Humanities and Social Sciences .....	18	Agriculture - Master of Agriculture .....	98
Life Sciences .....	19	Agriculture - Master of Business Administration .....	99
Physical Sciences and Engineering .....	19	Agricultural Economics - Master of Science .....	99
Teacher Education .....	19	Economic Development - Doctor of Economic Development .....	100
Essential Information for Students .....	20	Animal and Range Sciences .....	100
Undergraduate Admissions .....	20	Animal Science - Bachelor of Science in Agriculture .....	108
Transfer Undergraduate Students .....	22	Range Science - Bachelor of Science in Agriculture .....	109
International Undergraduate Students .....	23	Dairy Science- Undergraduate Minor .....	110
Tuition, Fees, and Other Expenses .....	26	Horse Management - Undergraduate Minor .....	110
Financial Aid & Scholarship Services .....	28	Human Animal Interaction - Undergraduate Minor .....	110
Registration .....	30	Livestock Production - Undergraduate Minor .....	111
Withdrawals .....	30	Ranch Management - Undergraduate Minor .....	111
Resources for Students .....	30	Range Science - Undergraduate Minor .....	111
Graduate Research Facilities .....	37	Agriculture - Master of Agriculture .....	111
Military and Veterans Programs (MVP) .....	43	Animal Science - Master of Science .....	112
General Education Courses .....	46	Range Science - Master of Science .....	113
Graduation Requirements .....	51	Animal Science - Doctor of Philosophy .....	113
Recognition of Academic Achievement .....	51	Range Science - Doctor of Philosophy .....	114
Preprofessional Programs .....	51	Animal Science - Graduate Minor .....	114
Academic Programs .....	51	Range Science - Graduate Minor .....	115
NMSU System Academic Regulations & Policies .....	53	Entomology, Plant Pathology and Weed Science .....	115
The Graduate School .....	76	Agricultural Biology - Bachelor of Science in Agriculture .....	118
College of Agricultural, Consumer, and Environmental Sciences .....	83	Entomology - Undergraduate Minor .....	120
General Agriculture .....	84	Pest Management - Undergraduate Minor .....	120
Agricultural and Extension Education .....	85	Plant Pathology - Undergraduate Minor .....	120
Agricultural and Community Development - Bachelor of Science in Agriculture .....	90	Weed Science - Undergraduate Minor .....	120
Agricultural and Extension Education - Bachelor of Science in Agriculture .....	90	Agricultural Biology - Master of Science .....	120
Agricultural and Extension Education - Undergraduate Minor .....	91	Family and Consumer Sciences .....	121
		Clothing, Textiles and Fashion Merchandising - Bachelor of Science in Family and Consumer Sciences .....	130

Family and Child Science - Bachelor of Science in Family and Consumer Sciences .....	131	Hotel, Restaurant and Tourism Management - Undergraduate Minor .....	173
Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences .....	132	Water Science and Management .....	173
Food Science and Technology - Bachelor of Science in Food Science and Technology .....	133	Water Science and Management - Master of Science .....	176
Human Nutrition and Dietetic Sciences - Bachelor of Science in Family and Consumer Sciences .....	134	Water Science and Management - Doctor of Philosophy .....	176
Child Advocacy Studies (CAST) - Undergraduate Minor .....	136	Applied Statistics - Graduate Minor .....	177
Clothing, Textiles and Fashion Merchandising - Undergraduate Minor .....	136	Geographic Information Science and Technology (GIS&T) - Graduate Minor .....	177
Culinary Science - Undergraduate Minor .....	136	College of Arts and Sciences .....	178
Family and Child Science - Undergraduate Minor .....	136	Aerospace Studies .....	181
Food Science - Undergraduate Minor .....	136	Aerospace Studies - Undergraduate Minor .....	182
Nutrition - Undergraduate Minor .....	136	Anthropology .....	182
Family and Consumer Sciences - Master of Science .....	136	Anthropology - Bachelor of Arts .....	190
Fish, Wildlife and Conservation Ecology .....	136	Anthropology - Undergraduate Minor .....	192
Conservation Ecology - Bachelor of Science in Conservation Ecology .....	141	Native American Studies - Undergraduate Minor .....	192
Fisheries and Wildlife Science - Bachelor of Science in Fish, Wildlife and Conservation Ecology .....	142	Sustainable Development - Undergraduate Minor .....	193
Conservation Ecology - Undergraduate Minor .....	145	Religious Studies - Undergraduate Minor .....	193
Wildlife Science - Undergraduate Minor .....	146	Anthropology - Master of Arts .....	194
Fish, Wildlife and Conservation Ecology - Master of Science in Fish, Wildlife and Conservation Ecology .....	146	Cultural Resource Management - Graduate Certificate .....	195
Plant and Environmental Sciences .....	147	Museum Studies - Graduate Certificate .....	195
Agronomy - Bachelor of Science in Agriculture .....	158	Anthropology - Graduate Minor .....	196
Environmental Science - Bachelor of Science in Environmental Science .....	159	Archaeology - Graduate Minor .....	196
Genetics and Biotechnology - Bachelor of Science in Genetics .....	159	Food Studies - Graduate Minor .....	196
Horticulture - Bachelor of Science in Agriculture .....	161	Native American Studies - Graduate Minor .....	197
Soil Science - Bachelor of Science in Agriculture .....	164	Art .....	197
Turfgrass Science and Management - Bachelor of Science in Agriculture .....	166	Art - Bachelor of Arts .....	205
Agronomy - Undergraduate Minor .....	168	Art - Bachelor of Fine Arts .....	206
Horticulture - Undergraduate Minor .....	168	Art - Undergraduate Minor .....	207
Soil Science - Undergraduate Minor .....	168	Art History - Undergraduate Minor .....	207
Turfgrass Science and Management - Undergraduate Minor .....	169	Museum Conservation - Undergraduate Minor .....	207
Horticulture - Master of Science .....	169	Art - Master of Arts .....	208
Plant and Environmental Science - Master of Science .....	169	Art - Master of Fine Arts .....	208
Plant and Environmental Science - Doctor of Philosophy .....	169	Astronomy .....	209
School of Hotel, Restaurant and Tourism Management .....	169	Astronomy - Undergraduate Minor .....	212
Hotel, Restaurant and Tourism Management - Bachelor of Science .....	172	Astronomy - Master of Science .....	214
		Astronomy - Doctor of Philosophy .....	214
		Biology .....	214
		Biology - Bachelor of Arts .....	223
		Biology - Bachelor of Science .....	224
		Conservation Ecology - Bachelor in Conservation Ecology .....	225
		Genetics and Biotechnology - Bachelor of Science in Genetics .....	226
		Microbiology - Bachelor of Science .....	228

Biology - Undergraduate Minor .....	229	Criminal Justice .....	271
Conservation Ecology - Undergraduate Minor .....	229	Criminal Justice - Bachelor of Criminal Justice .....	276
Genetics and Biotechnology - Undergraduate Minor .....	230	Child Advocacy Studies - Undergraduate Minor .....	277
Human Biology - Undergraduate Minor .....	230	Forensic Science - Undergraduate Minor .....	278
Microbiology - Undergraduate Minor .....	230	Law and Society - Undergraduate Supplemental Major .....	279
Biology - Master of Science .....	230	Criminal Justice - Master of Criminal Justice .....	279
Biology - Doctor of Philosophy .....	231	Economics, Applied Statistics, and International Business .....	280
Chemistry and Biochemistry .....	232	Economics - Bachelor of Arts .....	282
Biochemistry - Bachelor of Science .....	237	Economics - Undergraduate Minor .....	282
Chemistry - Bachelor of Arts .....	238	English .....	283
Chemistry - Bachelor of Science .....	238	English - Bachelor of Arts .....	293
Biochemistry - Undergraduate Minor .....	239	Creative Writing - Undergraduate Minor .....	296
Chemistry - Undergraduate Minor .....	239	English - Undergraduate Minor .....	297
Environmental Chemistry - Undergraduate Minor .....	239	Literature - Undergraduate Minor .....	297
Chemistry - Master of Science .....	240	Medieval and Early Modern Studies - Undergraduate Minor ...	298
Chemistry - Doctor of Philosophy .....	240	Rhetoric and Professional Communication - Undergraduate Minor	299
Communication Studies .....	240	English - Master of Arts .....	299
Communication Studies - Bachelor of Arts .....	244	Creative Writing - Master of Fine Arts in Creative Writing .....	301
Communication and National Security - Undergraduate Minor	245	Rhetoric and Professional Communication - Doctor of Philosophy	301
Communication Studies - Undergraduate Minor .....	245	Geography .....	302
Communication Studies - Master of Arts .....	245	Geography - Bachelor of Science .....	307
Communication and National Security - Graduate Minor .....	246	Geographic Information Systems - Undergraduate Minor .....	309
Communication Studies - Graduate Minor .....	246	Geography - Undergraduate Minor .....	309
Computer Science .....	246	Geography - Master of Applied Geography .....	309
Computer Science - Bachelor of Arts .....	255	Geographic Information Systems - Graduate Minor .....	310
Computer Science - Bachelor of Science .....	257	Geological Sciences .....	310
Computer Science - Bachelor of Science/Master of Science	259	Geology - Bachelor of Science .....	313
Algorithm Theory - Undergraduate Minor .....	260	Geology - Undergraduate Minor .....	316
Bioinformatics - Undergraduate Minor .....	261	Geology - Master of Science .....	316
Computer Systems - Undergraduate Minor .....	261	Government .....	316
Software Development - Undergraduate Minor .....	261	Government - Bachelor of Arts .....	322
Bioinformatics - Master of Science .....	261	American Government and Politics - Undergraduate Minor ....	323
Computer Science - Master of Science .....	262	Comparative Politics - Undergraduate Minor .....	323
Computer Science - Doctor of Philosophy .....	263	Government - Undergraduate Minor .....	324
Computer Science - Graduate Minor .....	264	International Relations - Undergraduate Minor .....	324
Creative Media .....	264	Political Theory - Undergraduate Minor .....	324
Animation and Visual Effects - Bachelor of Creative Media ....	269	Public Administration - Undergraduate Minor .....	324
Digital Film Making - Bachelor of Creative Media .....	270	Public Law - Undergraduate Minor .....	325
Animation and Visual Effects - Undergraduate Minor .....	271	Law and Society - Supplemental Major .....	325
Digital Film Making - Undergraduate Minor .....	271	Government - Master of Arts .....	325

Public Administration - Master of Public Administration .....	326	Molecular Biology - Doctor of Philosophy .....	381
MPA-MA Public History Program - Dual Degree .....	326	Bioinformatics (with Computer Science) - Graduate Minor .....	382
MPA-MCJ Program - Dual Degree .....	326	Molecular Biology - Graduate Minor .....	382
Security Studies - Graduate Minor .....	326	Music .....	382
History .....	327	Music - Bachelor of Music .....	391
History - Bachelor of Arts .....	335	Music Education - Bachelor of Music Education .....	393
History - Undergraduate Minor .....	336	Music - Undergraduate Minor .....	395
History - Master of Arts .....	336	Music - Master of Music .....	395
Public History and Public Administration - Dual M.A. Degree .....	337	Philosophy .....	396
History - Graduate Minor .....	337	Philosophy - Bachelor of Arts .....	398
Interdisciplinary Studies .....	337	Ethics - Undergraduate Minor .....	398
Applied Studies - Bachelor of Applied Studies .....	341	Philosophy - Undergraduate Minor .....	398
Gender and Sexuality Studies - Bachelor of Arts .....	342	Physics .....	399
Individualized Studies - Bachelor of Individualized Studies .....	343	Engineering Physics - Bachelor of Science in Engineering Physics .....	405
Gender and Sexuality Studies - Undergraduate Minor .....	343	Physics - Bachelor of Arts .....	405
International Studies - Undergraduate Minor .....	344	Physics - Bachelor of Science .....	407
Gender and Sexuality Studies -Graduate Minor .....	345	Physics - Undergraduate Minor .....	408
Journalism and Media Studies .....	345	Physics - Master of Science .....	409
Journalism and Media Studies - Bachelor of Arts .....	347	Physics - Doctor of Philosophy .....	409
Journalism and Media Studies - Undergraduate Minor .....	349	Physics - Graduate Minor .....	410
Languages and Linguistics .....	349	Psychology .....	410
Foreign Languages - Bachelor of Arts .....	358	Psychology - Bachelor of Arts .....	414
French - Undergraduate Minor .....	359	Psychology - Undergraduate Minor .....	415
German - Undergraduate Minor .....	359	Psychology - Master of Arts .....	415
Linguistics - Undergraduate Minor .....	359	Psychology - Doctor of Philosophy .....	416
Spanish - Undergraduate Minor .....	360	Psychology - Graduate Minor .....	417
Latin American Studies - Supplementary Major .....	360	Sociology .....	417
Chicano Studies - Supplementary Major .....	361	Sociology - Bachelor of Arts .....	422
Linguistics - Supplementary Major .....	361	Sociology - Undergraduate Minor .....	422
Spanish - Master of Arts .....	362	Sociology - Master of Arts .....	422
Mathematical Sciences .....	363	Theatre Arts .....	423
Mathematics - Bachelor of Science .....	371	Theatre Arts - Bachelor of Arts .....	426
Applied Mathematics - Supplemental Major .....	373	Theatre Arts - Undergraduate Minor .....	427
Mathematics - Undergraduate Minor .....	374	College of Business .....	428
Mathematics - Master of Science .....	375	Accounting and Information Systems .....	430
Mathematics - Doctor of Philosophy .....	375	Accounting - Bachelor of Accountancy .....	433
Military Science .....	377	Information Systems - Bachelor of Business Administration .....	433
Military Science - Undergraduate Minor .....	379	Accounting - Undergraduate Minor .....	433
Molecular Biology .....	379	Enterprise Systems - Undergraduate Minor .....	434
Molecular Biology - Undergraduate Minor .....	380	Information Systems - Undergraduate Minor .....	434
Molecular Biology - Master of Science .....	381		

Accounting - Master of Accountancy .....	434	Counseling and Community Psychology - Bachelor of Science .....	476
Information Systems - Graduate Minor .....	435	Counseling and Educational Psychology - Undergraduate Minor .....	478
Business Administration .....	436	Clinical Mental Health Counseling - Master of Arts .....	478
Business Administration - Master of Business Administration .....	437	Clinical Psychopharmacology - Master of Science .....	478
Engineering/MBA Program – Dual Degree .....	439	Counseling Psychology - Doctor of Philosophy .....	479
Business Administration - Doctor of Philosophy .....	439	School Psychology - Specialist in Education .....	479
Sustainability - Graduate Certificate .....	440	Integrated Behavioral Health Care - Graduate Minor .....	479
Economics, Applied Statistics, and International Business .....	440	Spanish Counseling - Graduate Minor .....	479
Economics - Bachelor of Arts in Economics .....	446	Curriculum and Instruction .....	480
Economics - Bachelor of Business Administration .....	446	Early Childhood - Bachelor of Science in Education .....	490
International Business - Bachelor of Business Administration .....	447	Elementary Education - Bachelor of Science in Education .....	491
Economics - Undergraduate Minor .....	447	Secondary Education - Bachelor of Science in Education .....	493
International Business - Undergraduate Minor .....	447	Zero-to-Four (Early Childhood)- Bachelor of Applied Studies .....	497
Applied Statistics - Master of Science .....	448	Early Childhood Education - Undergraduate Minor .....	498
Economics - Master of Arts .....	448	Education - Master of Arts .....	499
Economics - Doctor of Economic Development .....	449	Education - Master of Arts in Teaching .....	500
Public Utility Regulation and Economics - Graduate Certificate .....	450	Curriculum and Instruction - Doctor of Education .....	500
Applied Statistics - Graduate Minor .....	450	Curriculum and Instruction - Doctor of Philosophy .....	501
Economics - Graduate Minor .....	450	Online Teaching & Learning Technologies - Graduate Certificate .....	501
Finance .....	451	Educational Leadership and Administration .....	502
Finance - Bachelor of Business Administration .....	453	Educational Leadership and Administration - Undergraduate Minor .....	507
Business Law - Undergraduate Minor .....	454	Educational Administration - Master of Arts .....	507
Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor .....	455	Educational Administration - Doctor of Education .....	508
Finance - Undergraduate Minor .....	455	Educational Administration - Doctor of Philosophy .....	508
Risk Management and Insurance - Undergraduate Minor .....	455	Educational Administration (Higher Ed)- Graduate Minor .....	509
Finance - Graduate Certificate .....	456	Educational Administration (Pk-12)- Graduate Minor .....	509
Management .....	456	Educational Administration - Graduate Minor (Doctoral) .....	509
General Business - Bachelor of Business Administration .....	459	Kinesiology and Dance .....	509
Management - Bachelor of Business Administration .....	459	Athletic Training - Bachelor of Science in Athletic Training .....	522
Management - Undergraduate Minor .....	460	Dance - Bachelor of Arts in Dance .....	525
Sustainability - Undergraduate Minor .....	460	Kinesiology - Bachelor of Science in Kinesiology .....	527
Marketing .....	461	Dance - Undergraduate Minor .....	532
Marketing - Bachelor of Business Administration .....	463	Exercise Science - Undergraduate Minor .....	533
Advertising - Undergraduate Minor .....	464	Kinesiology - Doctor of Philosophy .....	533
Marketing - Undergraduate Minor .....	464	Special Education/Communication Disorders .....	534
Professional Selling - Undergraduate Minor .....	464	Communication Disorders - Bachelor of Science in Education .....	544
Sports Marketing - Undergraduate Minor .....	464	Special Education - Bachelor of Science in Education .....	546
College of Education .....	465	Communication Disorders - Master of Arts .....	552
Counseling and Educational Psychology .....	468		

Special Education - Master of Arts .....	552	Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology .....	615
Special Education - Doctor of Education .....	553	Engineering Technology - Information - Bachelor of Science in Engineering Technology .....	617
Special Education - Doctor of Philosophy .....	554	Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology .....	618
Special Education - Graduate Minor .....	555	Geomatics - Bachelor of Science in Geomatics .....	619
College of Engineering .....	556	Information and Communication Technology - Bachelor of Information and Communication Technology .....	620
Chemical & Materials Engineering .....	558	Digital Electronic Applications - Undergraduate Minor .....	621
Chemical Engineering - Bachelor of Science in Chemical Engineering .....	566	Digital Forensics - Undergraduate Minor .....	621
Biomedical Engineering - Undergraduate Minor .....	567	Geomatics - Undergraduate Minor .....	621
Brewery Engineering- Undergraduate Minor .....	567	Information Security Technology- Undergraduate Minor .....	622
Computational Engineering- Undergraduate Minor .....	567	Manufacturing - Undergraduate Minor .....	622
Materials Engineering - Undergraduate Minor .....	568	Renewable Energy Technologies - Undergraduate Minor .....	622
Nuclear Chemical Engineering - Undergraduate Minor .....	568	Industrial Engineering .....	623
Pre-Law in Intellectual Property - Undergraduate Minor .....	568	Industrial Engineering - Bachelor of Science in Industrial Engineering .....	627
Pre-Medicine Studies- Undergraduate Minor .....	568	Entrepreneurship - Undergraduate Minor .....	628
Chemical Engineering - Master of Science in Chemical Engineering .....	568	Industrial Engineering - Master of Science in Industrial Engineering .....	628
Chemical Engineering - Doctor of Philosophy .....	569	Engineering - Doctor of Philosophy .....	628
Materials Engineering - Graduate Minor .....	569	Systems Engineering - Graduate Certificate .....	628
Civil Engineering .....	570	Mechanical Engineering and Aerospace Engineering .....	629
Civil Engineering - Bachelor of Science in Civil Engineering ....	575	Aerospace Engineering - Bachelor of Science in Aerospace Engineering .....	635
Agricultural Engineering - Undergraduate Minor .....	577	Mechanical Engineering - Bachelor of Science in Mechanical Engineering .....	637
Civil Engineering - Master of Science in Civil Engineering .....	577	Aerospace Engineering - Undergraduate Minor .....	638
Environmental Engineering - Master of Science in Environmental Engineering .....	579	Mechanical Engineering - Undergraduate Minor .....	639
Engineering - Doctor of Philosophy .....	580	Aerospace Engineering - Master of Science in Aerospace Engineering .....	639
Electrical and Computer Engineering .....	580	Mechanical Engineering - Master of Science in Mechanical Engineering .....	640
Electrical Engineering - Bachelor of Science in Electrical Engineering .....	590	Aerospace Engineering - Doctor of Philosophy .....	640
Computer Engineering - Undergraduate Minor .....	593	Engineering - Doctor of Philosophy .....	641
Electrical Engineering - Undergraduate Minor .....	593	College of Health and Social Services .....	642
Electrical Engineering - Master of Science in Electrical Engineering .....	593	Nursing .....	642
Electrical Engineering - Doctor of Philosophy .....	594	Family Nurse Practitioner - Graduate Certificate .....	651
Digital Communications - Graduate Certificate .....	595	Psychiatric/Mental Health Nurse Practitioner - Graduate Certificate .....	652
Digital Signal Processing - Graduate Certificate .....	595	Nursing - Bachelor of Science in Nursing .....	652
Electric Energy Systems - Graduate Certificate .....	596	Nursing - Doctor of Philosophy .....	653
Telemetry - Graduate Certificate .....	596	Nursing Administration - Master of Science in Nursing .....	653
Engineering Physics .....	596	Nursing Practice - Doctor of Nursing Practice .....	654
Engineering Physics - Bachelor of Science in Engineering Physics .....	601		
Engineering Technology and Surveying Engineering .....	605		
Engineering Technology - Civil - Bachelor of Science in Engineering Technology .....	614		

Public Health Sciences .....	655	BIOL-BIOLOGY (BIOL) .....	727
Gerontology - Undergraduate Minor .....	660	BLAW-BUSINESS LAW (BLAW) .....	734
Master of Public Health/Master of Social Work - Dual Degree .....	660	BMGT-BUSINESS MANAGEMENT (BMGT) .....	735
Public Health - Bachelor of Public Health .....	661	BOT-BUSINESS OFFICE TECHNOLOGY (BOT) .....	737
Public Health - Graduate Certificate .....	661	BUSA-BUSINESS ADMINISTRATION (BUSA) .....	740
Public Health - Master of Public Health .....	662	C D-COMMUNICATION DISORDERS (C D) .....	740
Public Health Sciences - Undergraduate Minor .....	662	C E-CIVIL ENGINEERING (C E) .....	743
U.S.-Mexico Border Health Issues - Undergraduate Minor .....	663	C EP-COUNSELING & EDUC PSY (C EP) .....	747
Social Work .....	663	C J-CRIMINAL JUSTICE (C J) .....	754
Social Work - Bachelor of Social Work .....	668	C S-COMPUTER SCIENCE (C S) .....	759
Social Work - Master of Social Work .....	669	CAST-CHILD ADVOCACY STUDIES (CAST) .....	766
Master of Social Work/Master of Public Health - Dual Degree .....	671	CCDE-DEVELOPMENTAL ENGLISH (CCDE) .....	767
Alcohol Drug Counseling - Graduation Minor .....	671	CCDL-DEVELOPMENTAL ESL (CCDL) .....	767
Undergraduate Honors College .....	672	CCDM-DEVELOPMENTAL MATHEMATICS (CCDM) .....	767
The NMSU Community Colleges .....	676	CCDR-DEVELOPMENTAL READING (CCDR) .....	767
Course Listings .....	677	CCDS-DEVELOPMENTAL SKILLS (CCDS) .....	768
A E-AEROSPACE ENGINEERING (A E) .....	679	CHEF-CULINARY ARTS (CHEF) .....	768
A EN-AGRICULTURAL ENGINEERING (A EN) .....	680	CHEM-CHEMISTRY (CHEM) .....	770
A S-ARTS AND SCIENCES (A S) .....	680	CHIN-CHINESE (CHIN) .....	773
A ST- APPLIED STATISTICS (A ST) .....	681	CHME-CHEMICAL & MATERIALS ENGR (CHME) .....	773
ACCT-ACCOUNTING (ACCT) .....	682	CHSS - COMM HEALTH/SOC SRVCS (CHSS) .....	779
ACES-AGRI, CONSUMER & ENV SCIE (ACES) .....	684	CMI - CINEMA & FILM/VIDEO PROD (CMI) .....	779
AEEC-AGRICULTURAL ECON/ECON (AEEC) .....	685	CMT-CREATIVE MEDIA TECHNOLOGY (CMT) .....	784
AERO-AEROSPACE STUDIES (AERO) .....	686	COLL-COLLEGE (COLL) .....	788
AERT-AEROSPACE TECHNOLOGY (AERT) .....	687	COMM-COMMUNICATION (COMM) .....	789
AG E-AGRICULTURAL ECONOMICS (AG E) .....	688	CSEC-CYBERSECURITY (CSEC) .....	792
AGRO-AGRONOMY (AGRO) .....	690	CTFM-CLTHNG/TXTLS/FSHN MRCHDSG (CTFM) .....	792
AHS-ALLIED HEALTH SCIENCE (AHS) .....	692	DANC-DANCE (DANC) .....	793
ANSC-ANIMAL SCIENCE (ANSC) .....	693	DAS-DENTAL ASSISTING (DAS) .....	799
ANTH-ANTHROPOLOGY (ANTH) .....	698	DHYG-DENTAL HYGIENE/HYGIENIST (DHYG) .....	800
ARCT-ARCHITECTURE (ARCT) .....	704	DMS-DIAGNOSTIC MED SONOGRAPHY (DMS) .....	802
ART-ART (ART) .....	706	DRFT-DRAFTING (DRFT) .....	804
ASTR-ASTRONOMY (ASTR) .....	713	E E-ELECTRICAL ENGINEERING (E E) .....	807
AUTO-AUTOMOTIVE TECHNOLOGY (AUTO) .....	715	E S-ENVIRONMENTAL SCIENCE (E S) .....	814
AXED-AGRICULTURAL EXTN EDUC (AXED) .....	717	E T-ENGINEERING TECHNOLOGY (E T) .....	815
B A-BUSINESS ADMINISTRATION (B A) .....	721	ECDV-ECONOMIC DEVELOPMENT (ECDV) .....	821
BCHE-BIOCHEMISTRY (BCHE) .....	722	ECED-EARLY CHILDHOOD EDUCATION (ECED) .....	822
BCIS-BUSINESS COMPUTER SYSTEMS (BCIS) .....	723	ECON-ECONOMICS (ECON) .....	825
BCT-BUILDING CONSTRUCTION TECH (BCT) .....	725	EDLT-EDUCATION (EDLT) .....	827
BIL-BILINGUAL EDUCATION (BIL) .....	726	EDUC-EDUCATION (EDUC) .....	828
		ELA - EDUC LEADERSHIP & ADMIN (ELA) .....	833
		ELT - ELECTRONICS TECHNOLOGY (ELT) .....	837

ENGL-ENGLISH (ENGL) .....	838	LING-LINGUISTICS (LING) .....	912
ENGR-ENGINEERING (ENGR) .....	847	M E-MECHANICAL ENGINEERING (M E) .....	912
ENTR-ENTREPRENEURSHIP AND INNOVATION .....	848	M SC-MILITARY SCIENCE (M SC) .....	916
ENVE-ENVIRONMENTAL ENGINEERING (ENVE) .....	848	MAT-AUTOMATION & MANUFACTURING (MAT) .....	918
EPWS-ETMLGY/PLNT PTHLGY/WD SCI (EPWS) .....	849	MATH-MATHEMATICS (MATH) .....	919
FCS-FAMILY AND CHILD SCIENCE (FCS) .....	851	MGT-MANAGEMENT (MGT) .....	924
FCSC-FAMILY & CONSUMER SCI (FCSC) .....	853	MKTG-MARKETING (MKTG) .....	927
FCSE-FAMILY & CONSUMER SCI EDU (FCSE) .....	853	MOLB-MOLECULAR BIOLOGY (MOLB) .....	929
FIN-FINANCE (FIN) .....	854	MPH-MASTER OF PUBLIC HEALTH (MPH) .....	930
FIRE-FIRE INVESTIGATION (FIRE) .....	856	MSW-SOCIAL WORK (MASTERS) (MSW) .....	932
FREN-FRENCH (FREN) .....	858	MUS-MUSIC (MUS) .....	934
FRMG-FAMILY RESOURCE MGT (FRMG) .....	859	NA - NURSING ASSISTANT (NA) .....	941
FSTE-FOOD SCIENCE & TECHNOLOGY (FSTE) .....	860	NAV-NAVAJO (NAV) .....	943
FWCE-FISH,WILDLF,CONSERV ECOL (FWCE) .....	861	NURS-NURSING (NURS) .....	943
G S-GRADUATE STUDIES (G S) .....	864	OEBM-BIOMEDICAL TECHNOLOGY (OEBM) .....	955
GENE-GENETICS (GENE) .....	864	OECS-COMPUTER TECHNOLOGY (OECS) .....	955
GEOG-GEOGRAPHY (GEOG) .....	865	OEEM- PARAMEDIC (OEEM) .....	958
GEOL-GEOLOGY (GEOL) .....	869	OEET- ELECTRICAL TRADES (OEET) .....	961
GER-GERMAN (GER) .....	871	OEGR-DIGITAL GRAPHIC TECH (OEGR) .....	962
GERO-GERONTOLOGY (GERO) .....	872	OEGS-GEOGRAPHIC INFO SYS (OEGS) .....	962
GOVT-GOVERNMENT (GOVT) .....	872	OEPS-PUBLIC SAFETY (OEPS) .....	962
GPHY-GEOPHYSICS (GPHY) .....	877	OEPT-PHOTOGRAPHIC TRADES (OEPT) .....	962
GRAD CROSS UNIV EXCH (GREX) .....	877	OETS-TECHNICAL STUDIES (OETS) .....	963
HIST-HISTORY (HIST) .....	877	P E-PHYSICAL EDUCATION (P E) .....	963
HIT-HEALTH INFO TECHNOLOGY (HIT) .....	885	PE-P-PHYSICAL EDUCATION (PE P) .....	965
HNDS-HUMAN NUTRITION & DIET (HNDS) .....	886	PHIL-PHILOSOPHY (PHIL) .....	966
HON-HONORS (HON) .....	889	PHLS-PUBLIC HEALTH SCIENCES (PHLS) .....	967
HORT-HORTICULTURE (HORT) .....	893	PHYS-PHYSICS (PHYS) .....	970
HOST-HOSPITALITY AND TOURISM (HOST) .....	896	PL-S-PARALEGAL SERVICES (PL S) .....	975
HRTM-HOTEL/RESTRNT/TOURISM MGT (HRTM) .....	897	PORT-PORTUGUESE (PORT) .....	976
HVAC-HEATING/AC/REFRIGERATION (HVAC) .....	900	PSY-PSYCHOLOGY (PSY) .....	976
I B-INTERNATIONAL BUSINESS (I B) .....	900	RADT-RADIOLOGIC TECHNOLOGY (RADT) .....	979
I E-INDUSTRIAL ENGINEERING (I E) .....	901	RDG-READING (RDG) .....	980
ICT-INFO & COMMUNICATION TECH (ICT) .....	904	RESP - RESPIRATORY THERAPY (RESP) .....	982
INMT - INDUSTRIAL MAINTENANCE (INMT) .....	905	RGSC-RANGE SCIENCE (RGSC) .....	983
INTR-INTERDISCIPLINARY STUDIES .....	906	RXPP-PRESCRIP PRIV PRAC PSYCH (RXPP) .....	985
JOUR-JOURNALISM (JOUR) .....	906	S WK-SOCIAL WORK (S WK) .....	987
JPNS-JAPANESE (JPNS) .....	908	SMET-SCIENCE/MATH/ENG/TECH (SMET) .....	989
L SC-LIBRARY SCIENCE (L SC) .....	908	SOC-SOCIOLOGY (SOC) .....	989
LANG-LANGUAGE (LANG) .....	911	SOIL-SOIL (SOIL) .....	993
LAWE-LAW ENFORCEMENT (LAWE) .....	911	SP M-SPORTS MEDICINE (SP M) .....	995
LIB-LIBRARY SCIENCE (LIB) .....	912	SPAN-SPANISH (SPAN) .....	1000

SPCD-ENGLISH AS A SECOND LNG (SPCD) .....	1004
SPED-SPECIAL EDUCATION (SPED) .....	1004
STAT-STATISTICS (STAT) .....	1011
SUR-SURVEYING (SUR) .....	1012
SURG-SURGICAL TECHNOLOGY (SURG) .....	1013
TCEN-ENVIRONMENTAL/ENERGY TECH (TCEN) .....	1014
THTR-THEATRE (THTR) .....	1016
TOX-TOXICOLOGY (TOX) .....	1019
UNIV-UNIVERSITY STUDIES (UNIV) .....	1020
W S-WOMEN'S STUDIES (W S) .....	1020
WATR-WATER UTILITIES (WATR) .....	1023
WELD-WELDING TECHNOLOGY (WELD) .....	1024
WERC-WASTE MGT EDU/RSRCH CONS (WERC) .....	1026
WSAM-WATER SCIENCE & MGT (WSAM) .....	1026
Index .....	1028

# LAS CRUCES ACADEMIC CATALOG

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

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

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

The academic program requirements of each catalog are effective for a period of six academic years. This 2018-19 Catalog is effective summer 2018 through spring semester 2024. All other catalog content, including rules, regulations, course descriptions and prerequisites are effective only for the catalog's denoted academic year. While content changes are typically implemented between Catalog years, the catalog does not represent a contract and NMSU reserves the right to make modifications to the catalog at any time.

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

NMSU is transforming lives through discovery. With the help of your advisors, you can chart your own transformational journey, using this catalog as your guidebook.

Catalog Editor: *Kori Plank*

# UNIVERSITY LEADERSHIP

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## NEW MEXICO STATE UNIVERSITY

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### Grants

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Armstead, Beth, VP Student Services

Sheski, Harry, VP Academic Affairs

# THE HISTORY OF THE UNIVERSITY

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

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

## Mission

The New Mexico State University System is the state's land-grant university, serving the educational needs of New Mexico's diverse population through comprehensive programs of education, research, extension education, and public service.

## Vision

The New Mexico State University System will be a premier university as evidenced by demonstrated and quantifiable excellence in teaching, research, extension, outreach, service, economic development, and community engagement relative to its peer institutions.

To meet our vision of being a premier university, NMSU will be among the top quartile of peer institutions on 80% of measures of academic program and teaching quality, research productivity, and economic benefit to New Mexico. Community colleges will benchmark against all community colleges in New Mexico.

## Values

- Diversity and Inclusion
- Accountability
- Excellence
- Discovery
- Engagement

NMSU's Values began as a project completed by the first class of the Aggie Leadership Training Academy (<https://training.nmsu.edu/alta/2015aggie-leadership-training-academy>). In the fall of 2016, the University Administrative Council started with that work, and members contributed their top five values ([http://provost.nmsu.edu/plan/wp-content/uploads/sites/13/2012/07/Values-12\\_12\\_16.pdf](http://provost.nmsu.edu/plan/wp-content/uploads/sites/13/2012/07/Values-12_12_16.pdf)). This list was compiled from those contributions.

## Accreditation

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

The Higher Learning Commission  
230 North LaSalle St.

Suite 7-500  
Chicago, IL 60604-1411  
Phone: (800) 621-7440

In addition, the university maintains various specialized and professional accreditations, as listed at the beginning of each college section in the catalog, and as found at <https://accreditation.nmsu.edu/specialized-accreditation/>.

## NMSU Graduation and Retention Rates

These rates may be found on the NMSU Institutional Research web site at: <http://oia.nmsu.edu/data-reports/oiareports/>.

# PROGRAMS A-Z

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## A

- Accounting - Bachelor of Accountancy (p. 433)
- Accounting - Master of Accountancy (p. 434)
- Accounting - Undergraduate Minor (p. 433)
- Advertising - Undergraduate Minor (p. 464)
- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 635)
- Aerospace Engineering - Doctor of Philosophy (p. 640)
- Aerospace Engineering - Master of Science in Aerospace Engineering (p. 639)
- Aerospace Engineering - Undergraduate Minor (p. 638)
- Aerospace Studies - Undergraduate Minor (p. 182)
- Agricultural Biology - Bachelor of Science in Agriculture (p. 118)
- Agricultural Biology - Master of Science (p. 120)
- Agricultural Business Management- Undergraduate Minor (p. 97)
- Agricultural Economics - Master of Science (p. 99)
- Agricultural Economics and Business - Bachelor of Science in Agriculture (p. 96)
- Agricultural Engineering - Undergraduate Minor (p. 577)
- Agricultural and Community Development - Bachelor of Science in Agriculture (p. 90)
- Agricultural and Extension Education - Bachelor of Science in Agriculture (p. 90)
- Agricultural and Extension Education - Graduate Minor (p. 91)
- Agricultural and Extension Education - Master of Arts (p. 91)
- Agricultural and Extension Education - Undergraduate Minor (p. 91)
- Agricultural and Natural Resource Leadership - Undergraduate Minor (p. 91)
- Agriculture - Master of Agriculture (p. 98)
- Agriculture - Master of Agriculture (p. 111)
- Agriculture - Master of Business Administration (p. 99)
- Agronomy - Bachelor of Science in Agriculture (p. 158)
- Agronomy - Undergraduate Minor (p. 168)
- Alcohol and Drug Counseling - Graduate Minor (p. 671)
- Algorithm Theory - Undergraduate Minor (p. 260)
- American Government and Politics - Undergraduate Minor (p. 323)
- Animal Science - Bachelor of Science in Agriculture (p. 108)
- Animal Science - Doctor of Philosophy (p. 113)
- Animal Science - Graduate Minor (p. 114)
- Animal Science - Master of Science (p. 112)
- Animation and Visual Effects - Bachelor of Creative Media (p. 269)
- Animation and Visual Effects - Undergraduate Minor (p. 271)
- Anthropology - Bachelor of Arts (p. 190)
- Anthropology - Graduate Minor (p. 196)
- Anthropology - Master of Arts (p. 194)
- Anthropology - Undergraduate Minor (p. 192)
- Applied Mathematics - Supplemental Major (p. 373)
- Applied Statistics - Graduate Minor (p. 177)
- Applied Statistics - Graduate Minor (p. 450)

- Applied Statistics - Master of Science (p. 448)
- Applied Studies - Bachelor of Applied Studies (p. 341)
- Archaeology - Graduate Minor (p. 196)
- Art - Bachelor of Arts (p. 205)
- Art - Bachelor of Fine Arts (p. 206)
- Art - Master of Arts (p. 208)
- Art - Master of Fine Arts (p. 208)
- Art - Undergraduate Minor (p. 207)
- Art History - Undergraduate Minor (p. 207)
- Astronomy - Doctor of Philosophy (p. 214)
- Astronomy - Master of Science (p. 214)
- Astronomy - Undergraduate Minor (p. 212)
- Athletic Training - Bachelor of Science in Athletic Training (p. 522)

## B

- Biochemistry - Bachelor of Science (p. 237)
- Biochemistry - Undergraduate Minor (p. 239)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 382)
- Bioinformatics - Master of Science (p. 261)
- Bioinformatics - Undergraduate Minor (p. 261)
- Biology - Bachelor of Arts (p. 223)
- Biology - Bachelor of Science (p. 224)
- Biology - Doctor of Philosophy (p. 231)
- Biology - Master of Science (p. 230)
- Biology - Undergraduate Minor (p. 229)
- Biomedical Engineering - Undergraduate Minor (p. 567)
- Brewery Engineering- Undergraduate Minor (p. 567)
- Business Administration - Doctor of Philosophy (p. 439)
- Business Administration - Master of Business Administration (p. 437)
- Business Law - Undergraduate Minor (p. 454)

## C

- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 566)
- Chemical Engineering - Doctor of Philosophy (p. 569)
- Chemical Engineering - Master of Science in Chemical Engineering (p. 568)
- Chemistry - Bachelor of Arts (p. 238)
- Chemistry - Bachelor of Science (p. 238)
- Chemistry - Doctor of Philosophy (p. 240)
- Chemistry - Master of Science (p. 240)
- Chemistry - Undergraduate Minor (p. 239)
- Chicano Studies - Supplementary Major (p. 361)
- Child Advocacy Studies (CAST) - Undergraduate Minor (p. 136)
- Child Advocacy Studies - Undergraduate Minor (p. 277)
- Civil Engineering - Bachelor of Science in Civil Engineering (p. 575)
- Civil Engineering - Master of Science in Civil Engineering (p. 577)
- Clinical Mental Health Counseling - Master of Arts (p. 478)
- Clinical Psychopharmacology - (Postdoctoral) Master of Science (p. 478)
- Clothing, Textiles and Fashion Merchandising - Bachelor of Science in Family and Consumer Sciences (p. 130)

- Clothing, Textiles and Fashion Merchandising - Undergraduate Minor (p. 136)
- Communication Disorders - Bachelor of Science in Education (p. 544)
- Communication Disorders - Master of Arts (p. 552)
- Communication Studies - Bachelor of Arts (p. 244)
- Communication Studies - Graduate Minor (p. 246)
- Communication Studies - Master of Arts (p. 245)
- Communication Studies - Undergraduate Minor (p. 245)
- Communication and National Security - Graduate Minor (p. 246)
- Communication and National Security - Undergraduate Minor (p. 245)
- Comparative Politics - Undergraduate Minor (p. 323)
- Computational Engineering- Undergraduate Minor (p. 567)
- Computer Engineering - Undergraduate Minor (p. 593)
- Computer Science - Bachelor of Arts (p. 255)
- Computer Science - Bachelor of Science (p. 257)
- Computer Science - Bachelor of Science/Master of Science (p. 259)
- Computer Science - Doctor of Philosophy (p. 263)
- Computer Science - Graduate Minor (p. 264)
- Computer Science - Master of Science (p. 262)
- Computer Systems - Undergraduate Minor (p. 261)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 225)
- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 141)
- Conservation Ecology - Undergraduate Minor (p. 145)
- Conservation Ecology - Undergraduate Minor (p. 229)
- Counseling Psychology - Doctor of Philosophy (p. 479)
- Counseling and Community Psychology - Bachelor of Science (p. 476)
- Counseling and Educational Psychology - Undergraduate Minor (p. 478)
- Creative Writing - Master of Fine Arts in Creative Writing (p. 301)
- Creative Writing - Undergraduate Minor (p. 296)
- Criminal Justice - Bachelor of Criminal Justice (p. 276)
- Criminal Justice - Master of Criminal Justice (p. 279)
- Culinary Science - Undergraduate Minor (p. 136)
- Cultural Resource Management - Graduate Certificate (p. 195)
- Curriculum and Instruction - Doctor of Education (p. 500)
- Curriculum and Instruction - Doctor of Philosophy (p. 501)

## D

- Dairy Science - Undergraduate Minor (p. 110)
- Dance - Bachelor of Arts in Dance (p. 525)
- Dance - Undergraduate Minor (p. 532)
- Digital Communications - Graduate Certificate (p. 595)
- Digital Electronic Applications - Undergraduate Minor (p. 621)
- Digital Film Making - Bachelor of Creative Media (p. 270)
- Digital Film Making - Undergraduate Minor (p. 271)
- Digital Forensics - Undergraduate Minor (p. 621)
- Digital Signal Processing - Graduate Certificate (p. 595)

## E

- Early Childhood - Bachelor of Science in Education (p. 490)
- Early Childhood Education - Undergraduate Minor (p. 498)
- Economic Development - Doctor of Economic Development (p. 100)
- Economics - Bachelor of Arts (p. 282)
- Economics - Bachelor of Arts in Economics (p. 446)
- Economics - Bachelor of Business Administration (p. 446)
- Economics - Doctor of Economic Development (p. 449)
- Economics - Graduate Minor (p. 450)
- Economics - Master of Arts (p. 448)
- Economics - Undergraduate Minor (p. 282)
- Economics - Undergraduate Minor (p. 447)
- Education - Master of Arts (p. 499)
- Education - Master of Arts in Teaching (p. 500)
- Educational Administration - Doctor of Education (p. 508)
- Educational Administration - Doctor of Philosophy (p. 508)
- Educational Administration - Graduate Minor (p. 509)
- Educational Administration - Graduate Minor (p. 509)
- Educational Administration - Graduate Minor (p. 509)
- Educational Administration - Master of Arts (p. 507)
- Educational Leadership and Administration - Undergraduate Minor (p. 507)
- Electric Energy Systems - Graduate Certificate (p. 596)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 590)
- Electrical Engineering - Doctor of Philosophy (p. 594)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 593)
- Electrical Engineering - Undergraduate Minor (p. 593)
- Elementary Education - Bachelor of Science in Education (p. 491)
- Engineering - Doctor of Philosophy (p. 580)
- Engineering - Doctor of Philosophy (p. 628)
- Engineering - Doctor of Philosophy (p. 641)
- Engineering Physics - Bachelor of Science in Engineering Physics (p. 405)
- Engineering Physics - Bachelor of Science in Engineering Physics (p. 601)
- Engineering Technology - Civil - Bachelor of Science in Engineering Technology (p. 614)
- Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology (p. 615)
- Engineering Technology - Information - Bachelor of Science in Engineering Technology (p. 617)
- Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology (p. 618)
- Engineering/MBA Program – Dual Degree (p. 439)
- English - Bachelor of Arts (p. 293)
- English - Master of Arts (p. 299)
- English - Undergraduate Minor (p. 297)
- Enterprise Systems - Undergraduate Minor (p. 434)
- Entomology - Undergraduate Minor (p. 120)
- Entrepreneurship - Undergraduate Minor (p. 628)

- Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor (p. 455)
- Environmental Chemistry - Undergraduate Minor (p. 239)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 579)
- Environmental Science - Bachelor of Science in Environmental Science (p. 159)
- Ethics - Undergraduate Minor (p. 398)
- Exercise Science - Undergraduate Minor (p. 533)

## F

- Family Nurse Practitioner - Graduate Certificate (p. 651)
- Family and Child Science - Bachelor of Science in Family and Consumer Sciences (p. 131)
- Family and Child Science - Undergraduate Minor (p. 136)
- Family and Consumer Sciences - Master of Science (p. 136)
- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 132)
- Finance - Bachelor of Business Administration (p. 453)
- Finance - Graduate Certificate (p. 456)
- Finance - Undergraduate Minor (p. 455)
- Fish, Wildlife and Conservation Ecology - Master of Science in Fish, Wildlife and Conservation Ecology (p. 146)
- Fisheries and Wildlife Science - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 142)
- Food Science - Undergraduate Minor (p. 136)
- Food Science and Technology - Bachelor of Science in Food Science and Technology (p. 133)
- Food Studies - Graduate Minor (p. 196)
- Foreign Languages - Bachelor of Arts (p. 358)
- Forensic Science - Undergraduate Minor (p. 278)
- French - Undergraduate Minor (p. 359)

## G

- Gender and Sexuality Studies - Bachelor of Arts (p. 342)
- Gender and Sexuality Studies - Graduate Minor (p. 345)
- Gender and Sexuality Studies - Undergraduate Minor (p. 343)
- General Agriculture (p. 84)
- General Business - Bachelor of Business Administration (p. 459)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 159)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 226)
- Genetics and Biotechnology - Undergraduate Minor (p. 230)
- Geographic Information Systems - Graduate Minor (p. 177)
- Geographic Information Systems - Undergraduate Minor (p. 309)
- Geographic Information Systems- Graduate Minor (p. 310)
- Geography - Bachelor of Science (p. 307)
- Geography - Master of Applied Geography (p. 309)
- Geography - Undergraduate Minor (p. 309)
- Geology - Bachelor of Science (p. 313)
- Geology - Master of Science (p. 316)
- Geology - Undergraduate Minor (p. 316)
- Geomatics - Bachelor of Science in Geomatics (p. 619)

- Geomatics - Undergraduate Minor (p. 621)
- German - Undergraduate Minor (p. 359)
- Gerontology - Undergraduate Minor (p. 660)
- Government - Bachelor of Arts (p. 322)
- Government - Master of Arts (p. 325)
- Government - Undergraduate Minor (p. 324)

## H

- History - Bachelor of Arts (p. 335)
- History - Graduate Minor (p. 337)
- History - Master of Arts (p. 336)
- History - Undergraduate Minor (p. 336)
- Horse Management - Undergraduate Minor (p. 110)
- Horticulture - Bachelor of Science in Agriculture (p. 161)
- Horticulture - Master of Science (p. 169)
- Horticulture - Undergraduate Minor (p. 168)
- Hotel, Restaurant and Tourism Management - Bachelor of Science
- Hotel, Restaurant and Tourism Management - Undergraduate Minor
- Human Animal Interaction - Undergraduate Minor (p. 110)
- Human Biology - Undergraduate Minor (p. 230)
- Human Nutrition and Dietetic Sciences - Bachelor of Science in Family and Consumer Sciences (p. 134)

## I

- Individualized Studies - Bachelor of Individualized Studies (p. 343)
- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 627)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 628)
- Information Security Technology - Undergraduate Minor (p. 622)
- Information Systems - Bachelor of Business Administration (p. 433)
- Information Systems - Graduate Minor (p. 435)
- Information Systems - Undergraduate Minor (p. 434)
- Information and Communication Technology - Bachelor of Information and Communication Technology (p. 620)
- Integrated Behavioral Health Care - Graduate Minor (p. 479)
- International Agricultural Development and Extension - Graduate Minor (p. 91)
- International Business - Bachelor of Business Administration (p. 447)
- International Business - Undergraduate Minor (p. 447)
- International Relations - Undergraduate Minor (p. 324)
- International Studies - Undergraduate Minor (p. 344)

## J

- Journalism and Media Studies - Bachelor of Arts (p. 347)
- Journalism and Media Studies - Undergraduate Minor (p. 349)

## K

- Kinesiology - Bachelor of Science in Kinesiology (p. 527)
- Kinesiology - Doctor of Philosophy (p. 533)

**L**

- Latin American Studies - Supplementary Major (p. 360)
- Law and Society - Supplemental Major (p. 325)
- Law and Society - Undergraduate Supplemental Major (p. 279)
- Linguistics - Supplementary Major (p. 361)
- Linguistics - Undergraduate Minor (p. 359)
- Literature - Undergraduate Minor (p. 297)
- Livestock Production - Undergraduate Minor (p. 111)

**M**

- MPA-MA Public History Program - Dual Degree (p. 326)
- MPA-MCJ Program - Dual Degree (p. 326)
- Management - Bachelor of Business Administration (p. 459)
- Management - Undergraduate Minor (p. 460)
- Manufacturing - Undergraduate Minor (p. 622)
- Marketing - Bachelor of Business Administration (p. 463)
- Marketing - Undergraduate Minor (p. 464)
- Master of Public Health/Master of Social Work - Dual Degree (p. 660)
- Master of Social Work/Master of Public Health - Dual Degree (p. 671)
- Materials Engineering - Graduate Minor (p. 569)
- Materials Engineering - Undergraduate Minor (p. 568)
- Mathematics - Bachelor of Science (p. 371)
- Mathematics - Doctor of Philosophy (p. 375)
- Mathematics - Master of Science (p. 375)
- Mathematics - Undergraduate Minor (p. 374)
- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 637)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 640)
- Mechanical Engineering - Undergraduate Minor (p. 639)
- Medieval and Early Modern Studies - Undergraduate Minor (p. 298)
- Microbiology - Bachelor of Science (p. 228)
- Microbiology - Undergraduate Minor (p. 230)
- Military Science - Undergraduate Minor (p. 379)
- Molecular Biology - Doctor of Philosophy (p. 381)
- Molecular Biology - Graduate Minor (p. 382)
- Molecular Biology - Master of Science (p. 381)
- Molecular Biology- Undergraduate Minor (p. 380)
- Museum Conservation - Undergraduate Minor (p. 207)
- Museum Studies - Graduate Certificate (p. 195)
- Music - Bachelor of Music (p. 391)
- Music - Master of Music (p. 395)
- Music - Undergraduate Minor (p. 395)
- Music Education - Bachelor of Music Education (p. 393)

**N**

- Native American Studies - Graduate Minor (p. 197)
- Native American Studies - Undergraduate Minor (p. 192)
- Natural Resource Economics - Undergraduate Minor (p. 98)
- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 97)

- Nuclear Chemical Engineering - Undergraduate Minor (p. 568)
- Nursing - Bachelor of Science in Nursing (p. 652)
- Nursing - Doctor of Philosophy (p. 653)
- Nursing Administration - Master of Science in Nursing (p. 653)
- Nursing Practice - Doctor of Nursing Practice (p. 654)
- Nutrition - Undergraduate Minor (p. 136)

**O**

- Online Teaching & Learning Technologies - Graduate Certificate (p. 501)

**P**

- Pest Management - Undergraduate Minor (p. 120)
- Philosophy - Bachelor of Arts (p. 398)
- Philosophy - Undergraduate Minor (p. 398)
- Physics - Bachelor of Arts (p. 405)
- Physics - Bachelor of Science (p. 407)
- Physics - Doctor of Philosophy (p. 409)
- Physics - Graduate Minor (p. 410)
- Physics - Master of Science (p. 409)
- Physics - Undergraduate Minor (p. 408)
- Plant Pathology - Undergraduate Minor (p. 120)
- Plant and Environmental Science - Doctor of Philosophy (p. 169)
- Plant and Environmental Science - Master of Science (p. 169)
- Political Theory - Undergraduate Minor (p. 324)
- Pre-Law in Intellectual Property - Undergraduate Minor
- Pre-Medicine Studies- Undergraduate Minor (p. 568)
- Professional Selling - Undergraduate Minor (p. 464)
- Psychiatric/Mental Health Nurse Practitioner - Graduate Certificate (p. 652)
- Psychology - Bachelor of Arts (p. 414)
- Psychology - Doctor of Philosophy (p. 416)
- Psychology - Graduate Minor (p. 417)
- Psychology - Master of Arts (p. 415)
- Public Administration - Master of Public Administration (p. 326)
- Public Administration - Undergraduate Minor (p. 324)
- Public Health - Bachelor of Public Health (p. 661)
- Public Health - Graduate Certificate (p. 661)
- Public Health - Master of Public Health (p. 662)
- Public Health Sciences - Undergraduate Minor (p. 662)
- Public History and Public Administration - Dual M.A. Degree (p. 337)
- Public Law - Undergraduate Minor (p. 325)
- Public Utility Regulation and Economics - Graduate Certificate (p. 450)

**R**

- Ranch Management - Undergraduate Minor (p. 111)
- Range Science - Bachelor of Science in Agriculture (p. 109)
- Range Science - Doctor of Philosophy (p. 114)
- Range Science - Graduate Minor (p. 115)
- Range Science - Master of Science (p. 113)
- Range Science - Undergraduate Minor (p. 111)
- Religious Studies - Undergraduate Minor (p. 193)

- Renewable Energy Technologies - Undergraduate Minor (p. 622)
- Rhetoric and Professional Communication - Doctor of Philosophy (p. 301)
- Rhetoric and Professional Communication - Undergraduate Minor (p. 299)
- Risk Management and Insurance - Undergraduate Minor (p. 455)

## S

- School Psychology - Specialist in Education (p. 479)
- Secondary Education - Bachelor of Science in Education (p. 493)
- Security Studies - Graduate Minor (p. 326)
- Social Work - Bachelor of Social Work (p. 668)
- Social Work - Master of Social Work (p. 669)
- Sociology - Bachelor of Arts (p. 422)
- Sociology - Master of Arts (p. 422)
- Sociology - Undergraduate Minor (p. 422)
- Software Development - Undergraduate Minor (p. 261)
- Soil Science - Bachelor of Science in Agriculture (p. 164)
- Soil Science - Undergraduate Minor (p. 168)
- Spanish - Master of Arts (p. 362)
- Spanish - Undergraduate Minor (p. 360)
- Spanish Counseling - Graduate Minor (p. 479)
- Special Education - Bachelor of Science in Education (p. 546)
- Special Education - Doctor of Education (p. 553)
- Special Education - Doctor of Philosophy (p. 554)
- Special Education - Graduate Minor (p. 555)
- Special Education - Master of Arts (p. 552)
- Sports Marketing - Undergraduate Minor (p. 464)
- Sustainability - Graduate Certificate (p. 440)
- Sustainability - Undergraduate Minor (p. 460)
- Sustainable Development - Undergraduate Minor (p. 193)
- Systems Engineering - Graduate Certificate (p. 628)

## T

- Telemetry - Graduate Certificate
- Theatre Arts - Bachelor of Arts (p. 426)
- Theatre Arts - Undergraduate Minor (p. 427)
- Turfgrass Science and Management - Bachelor of Science in Agriculture (p. 166)
- Turfgrass Science and Management - Undergraduate Minor (p. 169)

## U

- U.S.-Mexico Border Health Issues - Undergraduate Minor (p. 663)

## W

- Water Science and Management - Doctor of Philosophy (p. 176)
- Water Science and Management - Master of Science (p. 176)
- Weed Science - Undergraduate Minor (p. 120)
- Wildlife Science - Undergraduate Minor (p. 146)

## Z

- Zero-to-Four (Early Childhood) - Bachelor of Applied Studies (p. 497)

# AREAS OF INTEREST

## What Are Meta-Majors?

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

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

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

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

## Applied and Clinical Health Sciences

- Athletic Training - Bachelor of Science in Athletic Training (p. 522)
- Human Nutrition and Dietetic Sciences - Bachelor of Science in Family and Consumer Sciences (p. 134)
- Kinesiology - Bachelor of Science in Kinesiology (p. 527)
- Nursing - Bachelor of Science in Nursing (p. 652)

## Applied Social and Behavioral Sciences

- Agricultural and Community Development - Bachelor of Science in Agriculture (p. 90)
- Anthropology - Bachelor of Arts (p. 190)
- Communication Studies - Bachelor of Arts (p. 244)
- Computer Science - Bachelor of Arts (p. 255)
- Counseling and Community Psychology - Bachelor of Science (p. 476)
- Family and Child Science - Bachelor of Science in Family and Consumer Sciences (p. 131)
- Geography - Bachelor of Science (p. 307)
- Public Health - Bachelor of Public Health (p. 661)
- Social Work - Bachelor of Social Work (p. 668)

- Sociology - Bachelor of Arts (p. 422)

## Business

- Accounting - Bachelor of Accountancy (p. 433)
- Agricultural Economics and Business - Bachelor of Science in Agriculture (p. 96)
- Agricultural and Community Development - Bachelor of Science in Agriculture (p. 90)
- Clothing, Textiles and Fashion Merchandising - Bachelor of Science in Family and Consumer Sciences (p. 130)
- Computer Science - Bachelor of Arts (p. 255)
- Economics - Bachelor of Business Administration (p. 446)
- Finance - Bachelor of Business Administration (p. 453)
- General Business - Bachelor of Business Administration (p. 459)
- Hotel, Restaurant and Tourism Management - Bachelor of Science
- Information Systems - Bachelor of Business Administration (p. 433)
- International Business - Bachelor of Business Administration (p. 447)
- Management - Bachelor of Business Administration (p. 459)
- Marketing - Bachelor of Business Administration (p. 463)
- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 97)

## Communication, Media Study, and Creative Arts

- Animation and Visual Effects - Bachelor of Creative Media (p. 269)
- Art - Bachelor of Arts (p. 205)
- Communication Studies - Bachelor of Arts (p. 244)
- Dance - Bachelor of Arts in Dance (p. 525)
- Digital Film Making - Bachelor of Creative Media (p. 270)
- English - Bachelor of Arts (p. 293)
- Foreign Languages - Bachelor of Arts (p. 358)
- Journalism and Media Studies - Bachelor of Arts (p. 347)
- Music - Bachelor of Music (p. 391)
- Music Education - Bachelor of Music Education (p. 393)
- Theatre Arts - Bachelor of Arts (p. 426)

## Humanities and Social Sciences

- Anthropology - Bachelor of Arts (p. 190)
- Communication Studies - Bachelor of Arts (p. 244)
- Criminal Justice (p. 271)
- Criminal Justice - Bachelor of Criminal Justice (p. 276)
- Economics - Bachelor of Arts in Economics (p. 446)
- English - Bachelor of Arts (p. 293)
- Foreign Languages - Bachelor of Arts (p. 358)
- Gender and Sexuality Studies - Bachelor of Arts (p. 342)
- Geography - Bachelor of Science (p. 307)
- Government - Bachelor of Arts (p. 322)
- History - Bachelor of Arts (p. 335)
- Philosophy - Bachelor of Arts (p. 398)
- Psychology - Bachelor of Arts (p. 414)

- Sociology - Bachelor of Arts (p. 422)

## Life Sciences

- Agricultural Biology - Bachelor of Science in Agriculture (p. 118)
- Agronomy - Bachelor of Science in Agriculture (p. 158)
- Animal Science - Bachelor of Science in Agriculture (p. 108)
- Biology - Bachelor of Science (p. 224)
- Computer Science - Bachelor of Arts (p. 255)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 225)
- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 141)
- Environmental Science - Bachelor of Science in Environmental Science (p. 159)
- Fisheries and Wildlife Science - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 142)
- Food Science and Technology - Bachelor of Science in Food Science and Technology (p. 133)
- General Agriculture (p. 84)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 159)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 226)
- Horticulture - Bachelor of Science in Agriculture (p. 161)
- Microbiology - Bachelor of Science (p. 228)
- Range Science - Bachelor of Science in Agriculture (p. 109)
- Soil Science - Bachelor of Science in Agriculture (p. 164)
- Special Education - Bachelor of Science in Education (p. 546)
- Turfgrass Science and Management - Bachelor of Science in Agriculture (p. 166)

## Physical Sciences and Engineering

- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 635)
- Biochemistry - Bachelor of Science (p. 237)
- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 566)
- Chemistry - Bachelor of Science (p. 238)
- Civil Engineering - Bachelor of Science in Civil Engineering (p. 575)
- Computer Science - Bachelor of Science (p. 257)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 590)
- Engineering Physics - Bachelor of Science in Engineering Physics (p. 601)
- Engineering Technology - Civil - Bachelor of Science in Engineering Technology (p. 614)
- Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology (p. 615)
- Engineering Technology - Information - Bachelor of Science in Engineering Technology (p. 617)
- Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology (p. 618)
- Geography - Bachelor of Science (p. 307)
- Geology - Bachelor of Science (p. 313)

- Industrial Engineering (p. 623)
- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 627)
- Mathematics - Bachelor of Science (p. 371)
- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 637)
- Physics - Bachelor of Science (p. 407)

## Teacher Education

- Agricultural and Extension Education - Bachelor of Science in Agriculture (p. 90)
- Early Childhood - Bachelor of Science in Education (p. 490)
- Elementary Education - Bachelor of Science in Education (p. 491)
- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 132)
- Music Education - Bachelor of Music Education (p. 393)
- Secondary Education - Bachelor of Science in Education (p. 493)
- Special Education - Bachelor of Science in Education (p. 546)

# ESSENTIAL INFORMATION FOR STUDENTS

The information provided in this section of the Academic Catalog is considered essential information for students throughout their time at New Mexico State University. The section includes information on Admissions, Tuition, Financial Aid, Military and Veterans Programs and General Education Course requirements. There are also sections pertaining to Student Resources such as Housing, Campus Activities and parking to name a few.

## Sections

- Undergraduate Admissions (p. 20)
- Transfer Undergraduate Students (p. 22)
- International Undergraduate Students (p. 23)
- Tuition, Fees and Other Expenses (p. 26)
- Financial Aid & Scholarship Services (p. 28)
- Registration (p. 62)
- Withdrawals (p. 70)
- Resources for Students (p. 30)
- Graduate Research Facilities (p. 37)
- Military and Veterans Programs (MVP) (p. 43)
- General Education Courses (p. 46)
- Graduation Requirements (p. 51)
- Recognition of Academic Achievement (p. 51)
- Preprofessional Programs (p. 51)
- Academic Programs (p. 51)

## Undergraduate Admissions

A student may be accepted for undergraduate admission to NMSU as either:

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

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

Requirements for admission as a degree-seeking student include the following:

- A formal application for admission, accompanied by a one-time \$20 nonrefundable application fee.
- An official transcript with the student's high school credits is to be sent directly from the high school to the Undergraduate Admissions Office. Students who attended a college or university while in high school must request official transcripts(s) sent directly to the Undergraduate Admissions Office by the Registrar of each college or any post-secondary educational institution previously attended, you may hand carry the official sealed and unopened school envelope to our office.
- Official results of the American College Testing Program (ACT) or Scholastic Aptitude Test (SAT) are to be sent directly from the Testing Centers to the Undergraduate Admissions Office. All freshman

applicants are required to submit scores from either the ACT or the SAT before a final admission is granted.

## Freshman Admission Requirements

Students who meet the minimum high school course requirements listed below must meet one of the following criteria in order to be admitted:

- Cumulative high school GPA of 2.75
- Ranked in the top 20 percent of their graduating class
- ACT composite score of 21 or SAT score\* of 990 (SAT score of 1060 for new format)

\*NMSU uses combined scores from the critical verbal and math portions of the SAT for admission and scholarship purposes. NMSU will be taking scores from the traditional SAT and the new SAT format, which was launched March 2016.

*Note: All entering freshmen must submit official ACT or SAT scores before final admission is granted. ACT code=2638, SAT=4531*

Subject	Units
English	4*
Math	4**
Science	2***
Foreign Language/Fine Art	1

*\*Must include at least 2 units of writing intensive courses, one of which must be a junior or senior level course*

*\*\*From Algebra I, Geometry, Algebra II, and one additional math course*

*\*\*\*Beyond general science*

Applicants who meet all the requirements listed above will be offered admission to NMSU. An applicant who does not meet all the requirements may also be offered admission if a review of their additional information indicates that the student would be successful at NMSU.

We encourage all students to apply for admission to NMSU. When reviewing the admissibility of students, we consider many factors, including high school GPA, test scores, dual-credit coursework, leadership experience, community involvement and other accomplishments. Applicants may be asked for additional information, including academic letters of recommendation, in support of their application.

## Aggie Pathway

In the Aggie Pathway to the Baccalaureate Program, our system of five campuses work together to navigate you toward a bachelor's degree – even if you initially don't meet admission requirements to the university. Aggie Pathway students may transition to the Las Cruces campus after successful completion of:

- 24 credits, in addition to any required developmental courses
- 2.50 cumulative college GPA

Students participating in the Aggie Pathway program can attend academic, cultural and athletic events on the NMSU Las Cruces campus. Students enrolling through NMSU Doña Ana have access to on-campus housing and dining. For more information, please visit <http://aggiepathway.nmsu.edu/> or call 575-646-8011.

## How to Apply as a GED or HISET Student

Students must complete the GED or HiSET in English. Satisfactory scores on either the GED or HiSet tests, official high school transcript and the ACT or SAT test are required.

## How to Apply as a Home School Student

The home school educator must submit a signed transcript or document that lists the courses completed and grades earned by the student, as well as, indicate the date the student completed or graduated from the home school program. The ACT or SAT test is also required.

Home school students who are New Mexico residents and wish to participate in the Lottery Success Scholarship program are required to submit official New Mexico GED or HiSET test results in English.

## Aggie Welcome and Orientation

At the mandatory Aggie Welcome and Orientation events students will attend information sessions, meet with an academic advisor and register for classes. Please remember that it is extremely important to submit your ACT or SAT scores prior to attending your Aggie Welcome and Orientation (AWO) program, as these scores are used to place you into academic courses. Students that do not have an ACT/SAT score in file for their AWO program will not receive a final schedule upon completion and may be subject to a change of schedule upon receiving official test scores. Students will also learn more about college life and campus resources.

For information, please contact the Aggie Welcome and Orientation Office at (575) 646-4496 or (575) 646-8038 and can be reached via email at [awo@nmsu.edu](mailto:awo@nmsu.edu) or <http://awo.nmsu.edu/>.

## How to Apply as a Nondegree Seeking Student

Nondegree admission is designed to meet the needs of non-traditional, part-time students who do not wish to pursue a degree at this university. Courses taken in this status may not be used to meet university admission requirements. Students interested in using nondegree credit for initial teacher certification or certification in a new field need to contact the College of Education.

Students on nondegree status are ineligible to receive financial aid or student employment; and are ineligible to participate in student government or intercollegiate athletics. They are also ineligible to receive benefits from any veterans' program.

Transcripts from previous institutions, high school, and/or results of college entrance exams may be required to assure readiness for university-level courses. A \$20 one-time, non-refundable, nondegree application fee is required.

Nondegree students are subject to the same university regulations as regular students.

## Changing from Nondegree Status

A nondegree student in good academic standing at NMSU must submit a formal application for a change of status from nondegree to degree seeking. Requirements for regular admission must be met. Nondegree students may not transfer more than 30 credits from this status to any undergraduate degree program with the exception of students participating in a high school concurrent enrollment program.

## How to Apply For Readmission

Former students of the NMSU system, who have been out of school for more than two consecutive semesters are required to make a formal application for readmission. Applications should be submitted to the Undergraduate Admissions Office before the opening of the semester or summer sessions for which the student plans to enroll.

A student who has attended other institutions during an absence must have official transcripts sent to the Undergraduate Admissions Office and must be eligible to return to the college or university they last attended. Transcripts must be received prior to the date of registration. Admission status at the time of readmission will normally be determined by previous NMSU academic standing. However, academic performance at other institutions attended during the applicant's absence from NMSU may be taken into consideration in determining the student's admission status.

## Opportunities for High Schools Students Dual Credit for High School Students

The Dual Credit Program is designed to give high school students an opportunity to enroll at NMSU prior to high school graduation. Students must be either a junior or senior in high school and enrolled in one-half or more of the minimum course requirements approved by the following:

- Public Education Department in a New Mexico public school district;
- Locally chartered and state-chartered charter school;
- State-supported school;
- Be in physical attendance at a bureau of Indian education-funded high school at least three documented contact hours per day.

Under Senate Bill 158 signed by the Governor and effective July 1, 2014, support for dual credit privileges at post-secondary institutions is now available for private and home school-eligible students. Under a Statewide Dual Credit Master Agreement between NMSU and the school district, students enrolled in approved dual credit courses are eligible to have the full cost of tuition and general fees waived.

Dual credit students must complete:

1. the Undergraduate Admission Application
2. provide official high school transcript and official ACT or SAT scores to the Undergraduate Admissions Office (and)
3. complete the State of New Mexico Dual Credit Request Form.

Requirements to be admitted to the dual credit or early admission programs are:

1. high school grade point average (GPA) of 3.0
2. an ACT composite of 23 or equivalent SAT score (and)
3. substantial progress toward completion of the following high school courses: 4 units of English, 4 units of Math (Algebra 1, Geometry, Algebra 2, and one additional math course), 2 units of Science (beyond General Science), 1 unit of foreign language or a unit of fine arts.

## Application Materials

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

## Application Deadlines

Applications for admission should be sent to the Undergraduate Admissions Office at least 30 days before the beginning of the regular semester or summer sessions in which the student intends to enroll. The deadline for application to NMSU's Nursing Program is February 1st for the fall semester and September 1st for the Spring semester.

## Out-of-State Students and Legal Jurisdiction

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

### Contact Information

For more information, contact:

Undergraduate Admissions Office, MSC 3A  
New Mexico State University  
PO Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-3121  
<http://admissions.nmsu.edu/>

## Transfer Undergraduate Students

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

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

### Community/Junior College Transfers

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

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

### Transfer Students- Admission Requirements

1. Transfer students must provide official transcripts sent directly from the University Student Records Office of each previously attended institution to the NMSU Admissions Office or official transcripts will be accepted if delivered in person only if in a sealed envelope

from the granting institution and with current issue date. Official transcripts must be received before the date of registration.

2. Students who have not earned credit for the first semester of college English may be required to provide ACT or SAT scores directly to the NMSU Admissions Office.
3. Students with 30 or more college credit hours must have a cumulative grade point average (GPA) of at least 2.0.
4. Students with 29 or fewer college credit hours must fulfill the freshman admission requirements and have an overall college GPA of at least a 2.50.
5. Students must be eligible to return to their last college or university.
6. Any student who conceals the fact that he/she has attended another college or university and has not submitted a transcript for each institution-whether or not credit was earned-will be subject to immediate suspension.
7. NMSU will uphold academic and judicial suspensions from other colleges and universities.

### General Requirements for Transfer Credits

Credit will be awarded for transfer courses as follows:

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

### Student Responsibility

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

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

### Evaluation of Transfer Credits

NMSU has 3 levels of course credit transfer. Once a student has been admitted to NMSU, they are awarded credit for equivalent courses accordingly. Following award of credit as described in Levels 1 and 2 (below), application of any additional credit transfer via specific Program Articulation agreements will be approved by the student's academic

department and dean, including additional courses in the major that may count toward a degree or a minor but, are not included in a Program Articulation.

### Level 1

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

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

### Level 2

Faculty established NMSU course-to-course equivalency transfer

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

### Level 3

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

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

## Religious Center Courses in Religion

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

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

1. Obtain written approval from the student's department head and academic dean prior to registration for the course
2. Count the credit in the course as part of the total semester load

3. Upon completion of the course, request that the institution granting the credit send a transcript of the credit to the Undergraduate Admissions Office at the NMSU-Las Cruces

## National Student Exchange (NSE)

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

## Currently Enrolled NMSU Students

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

## Transfer Credit Appeal Process

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

## International Undergraduate Students

Beginning Spring 2019, applications for admission must include a professional foreign credit evaluation report from a member institution of the National Association of Credential Evaluation Services (NACES) (<http://www.naces.org/members.html>) for every transcript from a foreign secondary school and/or university attended.

International students are an important and valuable part of NMSU's community. While international students enjoy all the rights, privileges and protections of domestic students, as well as subject to all the same responsibilities and regulations, some special policies are applicable only to international students. The Office of International Student and Scholar Services (ISSS) is responsible for ensuring the visa and admissions requirements are met. Some students not seeking degrees, such as international exchange students, may also work directly with the Office of Education Abroad.

## Federal Regulations

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

Legal immigrants (green card holders) should present documentation of their status to University Admissions and go through the same admission process as U.S. citizens.

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

1. For immigration purposes, each student must maintain full-time student status
    - a. Full time status for fall and spring semesters is defined as 12 or more credits for undergraduates (only 3 per semester allowable online).
    - b. Full time status for summer is defined as 6 or more credits for undergraduates (only 3 per summer allowable online).
    - c. Exceptions possible for final semester. Consult ISSS officials for more details.
  2. International students may not work off campus without authorization. On-campus employment may be authorized under certain conditions.
  3. All international students must maintain an up-to-date record in the ISSS Office. This record must indicate the student's current living address, phone number, and email address.
  4. Prior to admission, a prospective international student must demonstrate the following:
    - Academic ability to succeed in the chosen course of study.
    - Adequate financial support to complete the chosen course of study.
    - English language proficiency as defined by the university.
- (acceptable credit means classes that require a high proficiency in both written and oral English).
4. Students enrolling in certain programs where English language proficiency is not required.
  5. Students completing coursework in CELP. Satisfactory completion of each level in CELP requires a final grade of no less than 70% in all courses as evidenced by an end of level standardized test. If a student does not meet the 70% on the end of level test they will need to repeat the level. A level consists of classes in Listening/Speaking, Grammar, Writing, and Reading/Vocabulary. The test is comprised of sections that reflect those areas of English proficiency. Visit <http://celp.nmsu.edu/> for full details.

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

### **English Language Placement Test**

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

Based on the results of the ELPT, the student is either assigned to SPCD 110 (a bridge course designed to ensure success in ENGL 111 M), or is allowed to enroll directly into ENGL 111 M (for multilingual students). International students excused from SPCD 110 will be required to take ENGL 111 M. The student may then be required to complete one or more regular English classes as required for a particular degree. Completing basic English courses at other U.S. institutions does not automatically satisfy the ENGL 111 M requirement. Equivalencies for SPCD 110 and equivalencies for ENGL 111 M or ENGL 111G are determined by the University Student Records Office, who may refer exceptional cases to the English Department in the College of Arts and Sciences.

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

### **Conditional CELP Admission:**

NMSU, via Center for English Language Programs (CELP), conducts an Intensive English Language Program (IELP) for undergraduate students to prepare them to pursue their degree programs at NMSU. International students admitted into this conditional admission program are admitted to the university for the sole purpose of studying English with a guarantee of full admission to the university upon completion of the CELP program (subject to all other admission requirements). Only undergraduate students who are conditionally admitted and complete the full sequence of IELP courses, and have satisfactorily passed the end of program English proficiency test will be admitted to the University without the TOEFL or IELTS. Students must take the English Language Placement Test (ELPT) to be correctly placed within the English department's credit bearing courses. Placing out of levels by retaking the TOEFL is not allowable once conditional admission status has been granted. Visit <http://celp.nmsu.edu/> for full details.

Exchange students who are here to improve their English skills and participate in some credit courses will be placed in CELP according to their English language proficiency and will complete the sequence of intensive English until they complete the last class in the program. Then they will matriculate into the academic sector of the university for a semester of courses in their chosen fields.

## **University Procedures for International Students**

### **Regular Undergraduate Admission (Degree Seeking)**

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

### **English Language Proficiency Requirements**

For full undergraduate admission to the university, NMSU requires a score of 520 (paper-based) or 68 (internet-based) or better on the Test of English as a Foreign Language (TOEFL), a score of 6.0 on the International English Language Testing System (IELTS), or a 51 on the Pearson for all international students both non-degree and degree seeking. Prior to full admission, international students may also demonstrate English proficiency by satisfactorily completing NMSU's Center for English Language Programs (CELP) programs (see Conditional CELP Admission section).

A waiver of the TOEFL requirement may be considered for:

1. Students who are native speakers of English.
2. Students completing high school in the United States who (a) have attended the high school for at least two full years and (b) have scored in at least the 75th percentile in English on the ACT.
3. Students transferring from a junior college, or university in the United States who have earned a minimum of 30 acceptable semester credits (45 acceptable quarter credits) with a GPA of 2.0 or better

## Proof of Financial Support

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

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

## Admission Restrictions

International student admission may be prohibited based on one of the following conditions:

1. The dean of a chosen college, the department head of a chosen major, and the President of a Community College campus may refuse to grant admission.
2. There may be a disproportionate number of international students or a disproportionate number of a particular nationality in one department, college or community college.
3. Academic advisors may not be available.
4. Sufficient classroom-based courses are not available to maintain visa status (e.g. courses are online).

All application material, including the application for admission, letters of recommendation, transcripts, national examination scores, transcripts from colleges or universities (with an English translation), and test scores (including the TOEFL, Pearson's IELTS) should be sent directly to ISSS.

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

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

\* Contact the Office of Education Abroad for exchange program admission deadlines, and CELP for intensive English program deadlines.

## Miscellaneous Regulations

1. All international students are required to have student health insurance. Insurance will be automatically billed to the student's account each semester. (See <https://iss.nmsu.edu/index-3/health-insurance/> for more information.)
2. New international students are not permitted to register until all ISSS requirements are met, including attending orientation and taking the English Language Placement Test (when applicable, see English Language Proficiency Requirements section). All international students, are therefore, required to report to the campus to which

they were admitted. The following are the offices that a student may need to report to:

3. Students in non-degree exchange J-1 visa status must be engaged full time in a prescribed course of study. Consult ISSS for more details.
4. All international students are required to register at the Campus Health Center upon arrival and undergo a TB test or submit results of a current TB test done in the home country within a week of arriving. Guidelines will be provided by the Campus Health Center.
  - a. Las Cruces campus: International Student & Scholar Services, 152 Breland Hall Tel. (575) 646-2834, [iss@nmsu.edu](mailto:iss@nmsu.edu). (Note: Exchange students need to report to the Office of Study Abroad in 132 Garcia Annex.)
  - b. Doña Ana Community College: International Student & Scholar Services, 152 Breland Hall (exchange students need to report to the Office of Study Abroad in 132 Garcia Annex)
  - c. Alamogordo Community College: Office of Student Services, Student Services Building, second floor
  - d. Carlsbad Community College: Office of Student Services, 150 University Drive, Room 111
  - e. Grants Community College: Office of Student Services, Walter Martinez Building, Main Office Complex

## International Exchange Students

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

### Application Process for International Exchange Students

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

1. Nomination for exchange must be submitted by the Home University to the Incoming Exchange Coordinator by April 1 for Fall semester and October 1 for Spring semester. Please see your home university exchange coordinator for more information and to complete the nomination process.
2. Once nomination is received, students will be directed to make an account at the OEA website: <https://oea.nmsu.edu/students/incoming-exchange-students/applying-to-nmsu/>
3. The student is then required to complete the Exchange Student Nomination Form Questionnaire and upload the following documents:
  - a. Passport
  - b. Transcripts (in English)
  - c. Financial Document showing proof of \$5000 per semester attended. **ISEP students do not have to provide the financial documents**
  - d. Current TOEFL scores (2 years or less), see below for acceptable scores.

4. All international students, regardless of status, must apply for Admissions to NMSU <https://isss.nmsu.edu/adm-step-1/>. Once the Student's OEA application has been approved, **OEA Staff will submit the documents listed above to Admissions on behalf of the student.**

## Academic Restrictions

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

- Courses must be taken at Main Campus only. Community college courses, including DACC are not available to Exchange Students.
- The Nursing Department is the only department that is strictly off limits to exchange students, with case-by-case exception by the department and this would have to be approved well in advance of the student being nominated.
- Exchange students are required to abide by all pre-requisite requirements and class size restrictions (i.e, if a course is closed when the student goes to register, an exception cannot be made)
- Online courses are restricted due to visa requirements (no more than 3 credits can be taken online. Additional fees will apply.).

## Miscellaneous Regulations

- All international exchange students are required to be enrolled in NMSU approved health insurance. Office of Education Abroad will enroll the students and bill the insurance amount to the student's account.
- Exchange Students are required to attend a mandatory Orientation before courses begin. This will be scheduled and facilitated by the Office of Education Abroad; abiding by guidelines set forth by the US government per J-1 visa requirements.

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

# Tuition, Fees, and Other Expenses

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

## Campus Tuition Rates

For a full listing of all tuition rates from the NMSU System please see the University Accounts Receivable (<http://uar.nmsu.edu/tuition-fees/tuition-rates>) website.

## Additional Fees

Undergraduate admission application fee	\$20.00
Graduate admission application fee	\$40.00
New student orientation fee	\$165.00
International student admission application fee	\$50.00
International student orientation fee	\$50.00
Distance Education Course Delivery Fee (per credit)	\$35.00

ASNMSU Fee (Fall/Spring 1-11 credit enrollment)	\$33.50
ASNMSU Fee (Summer 1-8 credit enrollment)	\$12.40
Graduate Wellness/Fitness fee— (Fall/Spring 9-11 credits)	\$159.30
Undergraduate Course examination fee (per credit)	\$229.80
Graduate Course examination fee (per credit)	\$252.70
Certificate degree fee	\$25.00
Bachelor or Associate degree fee	\$25.00
Master or Doctorate degree fee	\$35.00
Degree application late filing fee	\$25.00
Late Registration Fee Base Cost	\$25.00
Engineering Technology Fee	\$145.00
Thesis binding fee (3 copies)	\$38.50
Thesis binding molecular biology / astronomy majors (4 copies)	\$48.50
Dissertation binding fee (3 copies)	\$38.50
Dissertation molecular biology / astronomy majors (4 copies)	\$48.50

## Course Fees (Fees Assessed Per Course)

See the Course Fee (<http://uar.nmsu.edu/tuition-fees/tuition-rates>) page for a list of courses with additional fees.

Applied Music courses - see Music (p. 382) section of catalog

## Mandatory International Student Fees

All international students are required to have health insurance coverage. International student health insurance is provided by HTH Worldwide unless otherwise covered by comparable health and accident insurance approved by the International Student Services. International students will be required to purchase health insurance for spring and summer during spring registration unless they have applied for spring graduation. (See below) All international undergraduate students will be assessed a \$36 International Student Program Fee each semester.

## Optional Fees

### Wellness/Fitness Fee - Rates may Increase for 2018-2019

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

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

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

## Health Insurance

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

## Housing Services

See the Students Resources (p. 30) section for room descriptions, accommodations, application process, deposit requirement, regulations and eligibility.

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

## Dining Services

See Housing and Residential Life (p. 30) section for meal plan descriptions, application process, deposit requirement, regulations and eligibility. Freshmen living on campus must choose between Aggie Unlimited and Aggie Choice Plans.

	Fall/Spring	Summer
Aggie Unlimited (unlimited entrances + 100 Aggie Dining \$)	\$1,951.00	n/a
Aggie Choice (230 entrances + 325 Aggie Dining \$)	\$1,898.00	n/a
Aggie 64 (64 entrances + 325 Aggie Dining \$)	\$918.00	n/a
Pistol 400 (0 entrances + 400 Aggie Dining \$)	\$412.00	n/a
Family Resident Optimum 350 (350 entrances)	\$1,426.00	n/a
Family Resident Optimum 250 (250 entrances)	\$1,019.00	n/a
Aggie Choice 150 (150 Entrances)	\$1,334.00	n/a
Aggie Choice 100 (100 Entrances)	\$1,026.00	n/a

## Payment of Charges

By enrolling in classes at NMSU, a student makes a financial commitment to pay the tuition and fee charges associated with his/her enrollment. The enrollment action constitutes a financial obligation between the student and NMSU and all proceeds of this agreement will be used for education purposes and constitutes an education loan pursuant to 11 U.S.C 523(a) (8). Terms and Conditions of Course Registration are posted on the University Accounts Receivable (UAR) website and available at time of Registration. Payments can be made by mail, web, telephone, or in person at University Accounts Receivable. Cash, checks, money orders and limited types of credit cards are

accepted. All financial aid received must be paid towards balances owed. Additional penalty charges will be assessed for failure to make payments when due. The University reserves the right to cancel registration of any student who fails to pay, when due, any indebtedness to the institution if not completed by the deadlines as outlined on the UAR website under Important dates related to your Student Account. Transcripts and diplomas will be withheld until all financial obligations are paid in full. Students are prohibited from registering for a term/semester until all previous debts due to the University are paid in full.

## Tuition Adjustments, Refunds and Forfeitures

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

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

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

## Delinquent and Prior-Term Balances

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

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

## Dishonored Financial Transactions - Checks, Credit Cards, ACH Transactions

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

## Late Registration Fee

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

## Estimating Other Expenses

In addition to the direct costs stated above, other expenses per semester may include such items as textbooks and supplies (estimated at \$300) and personal expenses (estimated at \$460).

## Cooperative Education

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

## Ways to Qualify for Lower Tuition Rates

Resident or nonresident status is determined in accordance to a uniform definition established for all New Mexico institutions by the Higher Education Department, State of New Mexico. The NMSU Registrar's Office administers residency. Information on the following programs may be obtained from the University Admissions, the University Financial Aid and Scholarship Services, the NM Administrative Code (NMAC) 5.7.18.

- American Indian Agreement
- Athletic Grant
- Colorado-Arizona Reciprocal Agreement
- Dual Credit
- Fire Fighter and Peace Officer Survivor Scholarship
- Foreign Military Dependent
- Foreign Military Spouse
- Foreign Military Stationed in New Mexico
- Graduate Assistantship
- Immigrant Student (NM HS GRAD)
- Military Dependent
- Military Spouse
- Military Stationed in New Mexico
- NM Competitive Scholarship
- Part-time Students
- Senior Citizen Waiver
- Summer Session
- Texas 135
- Veteran Waiver
- Western Undergraduate Exchange
- WICHE/WUE

WUE states include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming and the Commonwealth of the Northern Mariana Islands. For more information about any of the above ways to qualify for lower tuition rates please contact the University Accounts Receivable Office or the University Registrar's Office.

## Contact Information

For more information, contact:

University Accounts Receivable, MSC 4570  
New Mexico State University  
PO Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-4911

<http://uar.nmsu.edu>

## Financial Aid & Scholarship Services

University Financial Aid and Scholarship Services administers a broad spectrum of loans, grants, scholarships and work-study funding in an attempt to meet the financial need of the university's students.

University Financial Aid and Scholarship Services awards financial aid to students according to their individual calculated need. Parents of students are expected to contribute to their child's education according to their ability, taking into account their income, assets, number of dependents and other relevant information. Students themselves are expected to contribute from their own assets and earnings, including appropriate borrowing against future income. All information provided to University Financial Aid and Scholarship Services is regarded as confidential.

Students applying for financial aid must complete a Free Application for Federal Student Aid (FAFSA) designed to determine, in accordance with state and federal guidelines, the difference between what the student and/or family is expected to contribute and the cost of attending any campus within the NMSU System. Among the factors that determine the family's Expected Family Contribution (EFC) are:

1. Annual adjusted gross income based on year tax return as reported to the Internal Revenue Service;
2. Savings, stocks, and/or bonds;
3. Other assets in the form of a business, farm or real estate;
4. Nontaxable income and benefits; and
5. Student's income and assets.

Students applying for financial aid should complete a FAFSA by visiting [www.fafsa.ed.gov/](http://www.fafsa.ed.gov/) (<http://www.fafsa.ed.gov/>)

Please refer to the NMSU-Las Cruces, Financial Aid and Scholarship Services web site for more information on available financial aid. A complete listing of programs and policies is available here (<https://fa.nmsu.edu>).

## General Eligibility Requirements

To receive financial aid you must be enrolled as a degree seeking student in an eligible degree or certificate program and demonstrate that you are qualified to obtain an education by:

- Having a high school diploma or a recognized equivalent such as a General Educational Development (GED) certificate or
- Completing a high school education in a home-school setting approved under state law.

If you were enrolled in college in an eligible program or career school prior to July 2, 2012, you may show you are qualified to obtain a higher education by:

- Having passed an approved ability-to-benefit test (if you don't have a diploma or GED, a college can administer a test to determine whether you can benefit from the education offered at that school);
- Completing six credit hours or equivalent course work toward a degree or certificate (you may not receive aid while earning the six credit hours)
- Be enrolled or accepted for enrollment as a regular student working toward a degree or certificate in an eligible program.

- Be a U.S. citizen or eligible noncitizen (state funded scholarships are available to undocumented students).
- Have a valid Social Security number. If you don't have a Social Security number, you can find out more about applying for one at [www.ssa.gov](http://www.ssa.gov) (<http://www.ssa.gov>).
- Must be meeting satisfactory academic progress (SAP).
- Sign a statement on the FAFSA certifying that you will use Federal student aid only for educational purposes.
- Sign a statement on the FAFSA certifying that you are not in default on a federal student loan and that you do not owe money back on a federal student grant.
- Register with the Selective Service, if required.

## Financial Aid Awards

All financial aid awards are based on information provided by the student and/or parents, availability of funds and eligibility requirements. Any award may be revised based on changes in enrollment, cost of attendance, application for graduation, family contribution or failure to meet satisfactory academic progress. Withdrawals or reductions in enrollment may affect an award or any future awards. Financial Aid will not pay for audited courses or some repeats.

### Federal Direct Subsidized Loans

This is a loan program for eligible undergraduate students who demonstrate financial need. The U.S. Department of Education pays the interest on a Direct Subsidized Loan while the student is enrolled in school at least half-time.

Eligible first time undergraduate student loan borrowers are subject to a maximum time period to receive Federal Direct Subsidized Loans. Students may not receive Federal Direct Subsidized Loans for more than 150% of the published length of their academic program (measured in academic years). A complete explanation of Subsidized Loan usage limits is available at: <https://fa.nmsu.edu/loans/federal-direct-loans/>.

### Federal Direct Unsubsidized Loans

Loans that are made to eligible undergraduate who do not demonstrate financial need and graduate students. Unlike other federal loans, interest accrues while the student is attending school.

### Federal Direct Loan Requirements

Students receiving a subsidized or unsubsidized Federal Direct Loan, must complete an online entrance counseling session and a master promissory note before NMSU will issue the funds. In addition, students must complete an exit interview upon graduation or withdrawal from the university.

Repayment of a Federal Direct loan begins six months after graduation or six months after enrollment drops below half-time (less than 6 credits for undergraduate students and less than 5 credits for graduate students).

### Grants

The Federal Pell Grant is a federal grant available to undergraduate students with documented financial need. If the Pell Grant is insufficient to pay educational expenses, the student may be eligible to receive other types of aid, including a Federal Supplemental Educational Opportunity Grant (SEOG) or Leveraging Education Assistance Partnership Program Grant (LEAP), and/or other miscellaneous grants. These grants are awarded to undergraduate students who demonstrate exceptional financial need. Funds are limited and are awarded based on need and

the priority date. For more information, contact University Financial Aid and Scholarship Services or visit the university's financial aid website at: <http://fa.nmsu.edu/>. Generally, grants do not have to be repaid.

## Work-Study Programs

The Federal and New Mexico State Work-Study Programs provide employment opportunities for eligible students.

For more information on the U.S. Department of Education student aid programs, go to <http://studentaid.ed.gov/> or see the NMSU Financial Aid web site at <http://fa.nmsu.edu> (<http://fa.nmsu.edu>).

## Scholarships and Other Aid

Many students finance part of their education with scholarships, which may be awarded for academic achievement, special skills, talent and/or based on the applicants calculated financial need.

The NMSU System offers a variety of scholarships to incoming freshman, transfer, continuing and graduate students. State, institutional and private scholarships may also be available but amounts, deadlines and eligibility requirements vary. For more information, contact University Financial Aid and Scholarship Services or visit the university's scholarship web site at <http://fa.nmsu.edu/scholarships/>

To be considered for most scholarships through the NMSU System you are required to apply online through Scholar Dollar\$, at <https://scholarships.nmsu.edu/>. One scholarship application serves all students in the NMSU system, regardless of campus.

## Withdrawals

Recipients of financial aid grants and loans who drop credits or withdraw may be required to return all or a portion of awarded Title IV funds. Further information regarding the return of Title IV funds is available on the NMSU-Las Cruces web site at <http://fa.nmsu.edu/return-of-title-iv-funds/>.

## Financial Aid Satisfactory Academic Progress

Federal regulations require that financial aid recipients meet certain academic standards to be eligible for federal financial aid. To ensure that financial aid recipients are making satisfactory academic progress, academic transcripts are reviewed at the end of each term to determine eligibility for the next term. All terms of attendance are reviewed, including periods in which the student did not receive financial aid. All transfer credit hours are taken into account when satisfactory progress is reviewed. The Financial Aid SAP standards are not the same as the NMSU System's Academic Standards of Progress criteria.

## Elements of Financial Aid Satisfactory Academic Progress

- **Qualitative Progress:** Undergraduate students must maintain a cumulative GPA of at least 2.0 (a C- average). Graduate students must maintain a cumulative GPA of at least 3.0 (a B average).
- **Completion Rate:** Students must complete a minimum of 70 percent of all coursework (registered credit hours) attempted within the NMSU System. Any course with a grade of withdraw (W), incomplete (I), repeats (RR), failure (F), audit (AU), or no credit (NC) are considered as attempted but not considered completed coursework. Repeated courses are included in the calculation.
- **Maximum Time Frame:** Students must complete their program within 150 percent of the published length required by the program.

Students who have reached the maximum allowable time will be suspended from receiving financial aid. Limited developmental/remedial hours are excluded from this calculation. Total attempted hours including repeated courses and transfer coursework are included in the student's maximum time frame calculation.

## Financial Aid Warning

"Warning" is a status assigned to a student the first semester they fail to meet the standard of satisfactory academic progress measured as Qualitative Progress and Completion Rate. If the student has not returned to satisfactory standing after this warning semester, he or she will be suspended from further financial assistance until satisfactory progress standards are met.

## Financial Aid Suspension

Students are suspended from receiving financial aid if they do not meet satisfactory academic progress standards for financial aid purposes. Students on financial aid suspension will not receive any form of federal or state financial aid (grants, loans, work study). Financial aid eligibility is reinstated when all standards of satisfactory progress are met.

## The Appeal Process

Students suspended from financial aid may appeal the suspension if there are extenuating circumstances affecting their progress. Students who would like to appeal the suspension must submit an appeal form, available at: <http://fa.nmsu.edu>. They must also submit all supporting documentation to University Financial Aid and Scholarship Services.

A committee will review the appeal and may grant reinstatement of financial aid based on the extenuating circumstances that directly contributed to the deficient academic performance. Appeals are evaluated on a term-by-term basis. All appeals, including relevant documentation, must be submitted by the semester deadline based on the current semester of enrollment. A student may *appeal the termination of eligibility only twice during his or her career* within the New Mexico State University System.

## Contact Information

For more information, contact:

Las Cruces Campus Financial Aid Office  
MSC 5100  
PO Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-4105  
<http://fa.nmsu.edu/>

## Registration

For information about Registration please see the NMSU System Academic Regulations (p. 53) section of the catalog and the University Student Records Office website (<https://records.nmsu.edu>).

## Withdrawals

For information about Withdrawals please see the NMSU System Academic Regulations (p. 53) section of the catalog and the University Student Records Office website. (<https://records.nmsu.edu>)

## Resources for Students

### Aggie Health & Wellness Center

The university maintains a well-equipped integrated health center on campus, with a comprehensive medical care, laboratory, pharmacy, x-ray, and counseling services. Hospitalization and emergency services are available in the community. Undergraduate students are eligible for services at the Center. Those students enrolled for 12 or more credits (6 in a summer session) may access the Center as fees have been paid through full-time enrollment. Students enrolled for less than 12 credits (5 in summer session) may choose to pay the wellness fee or office fee for medical care. The Center accepts payment for medical services through cash, credit card, student account and insurance reimbursement.

Counseling services at Aggie Health & Wellness provide students and the campus with individual, couples and group counseling, crisis intervention, career counseling, outreach programs, and consultation. We assist students who are dealing with issues such as relationship concerns, depression, anxiety, stress management, trauma and self-esteem. In addition, Aggie Health & Wellness also has services and resources that support harm reduction. These services include: WAVE (Wellness, Alcohol, and Violence Education) which provides the campus with information concerning the decisions that surround alcohol use, sexual assault, and violence prevention; social work services operates the Aggie Cupboard, an on-campus food pantry and provides resource support for students who may need assistance with housing, insurance or other basic needs. All services are strictly confidential and are free.

The Aggie Health & Wellness Center is open Monday- Friday from 8:00 am - 11:30 am & 1:00pm - 5:00 pm. The Center is closed during the lunch hour. The Center is located on the corner of Breland and Stewart Sts. For more information, please call (575) 646-1512 or visit the website at [wellness.nmsu.edu](http://wellness.nmsu.edu) (<http://wellness.nmsu.edu>).

## Campus Activities

The Office of Campus Activities offers involvement outside the classroom, an essential component of the student's academics. Campus Activities collaborates with campus and community entities to create opportunities for student involvement, group and individual leadership and personal development. Campus Activities coordinates activities and events through the Activity Registration process for chartered student organizations, administers the University Sales and Solicitation Policy, the Freedom of Expression Policy, and serves as the university liaison to the Interfaith Council.

## Campus Dining

First-year students living in the residence halls, who recently graduated from high school, are required to participate in a Meal Plan and are limited to the Aggie Unlimited and the Aggie Choice 230. The Meal Plan dining contract runs for an entire academic year (unless applying for the Spring Semester only) and charges are applied to a student's university account each semester.

Any registered student may participate in the Meal Plan program whether living on or off campus to include continuing, commuter, as well as Graduate students. A variety of Meal Plan choices are available to suit their lifestyle.

Application procedures and additional information may be obtained from the ID Card Services Office by calling (575) 646-4835 or via e-mail at [idsvs@nmsu.edu](mailto:idsvs@nmsu.edu), or by stopping by Room 137 in Corbett Center Student

Union between 8:00 am - 4:30 pm Monday - Friday. The mailing address is:

ID Card Services Office  
PO Box 30001, MSC 3 ID  
Las Cruces, NM 88003

### Other Food Services Options

In addition to the Meal Plans, food service is available at various locations throughout the campus by using cash, NMSU Aggie Cash, the NMSU Enhanced Aggie ID Card, a credit/debit card, or, in most areas, the Aggie Dining Dollars included with a Meal Plan package. Food service location hours are available at [dining.nmsu.edu](https://dining.nmsu.edu) (<https://dining.nmsu.edu>). Additional information can be obtained by contacting the ID Card Office between 8:00 am - 5:00 pm at (575) 646-4835, [idsvs@nmsu.edu](mailto:idsvs@nmsu.edu), by visiting the office on the 1st floor of the Corbett Center Student Union. You may also visit us at [idcard.nmsu.edu](https://idcard.nmsu.edu) (<https://idcard.nmsu.edu>).

## Campus Tutoring Service

Tutoring services are provided to all NMSU students for courses offered at the University. The tutors at Campus Tutoring Services are highly trained undergraduate students who have succeeded in the courses they tutor in and are certified by the College Reading and Learning Association. The tutor's focus is to assist all students academically by ensuring concepts are learned. All students are encouraged to come prepared to ensure a productive tutoring session. No appointment is necessary and a student may visit unlimited times. Campus Tutoring Services also offers synchronous online tutoring for select courses.

For more information on Campus Tutoring Services, please visit us in Corbett Center Student Union, Room 208, call (575)646-6050, or review our services at [campustutoring.nmsu.edu](https://campustutoring.nmsu.edu) (<https://campustutoring.nmsu.edu>).

## Career Services

The mission of Career Services is to offer programs, services, and resources that will contribute to students life-long career planning efforts. Staff members work closely with deans, department heads, faculty and employers to assist students and alumni in developing suitable career opportunities based on their education, experiences, and interests. Additionally, Career Services coordinates interviews between prospective employers, students, and alumni. The staff advises students on the career-planning process and career-search strategies. Current information on employment trends and electronic career products help students make educated decisions. Also, career fairs are held throughout the academic year. Students can launch their career plans through registration in AggieCAREER Manager.

Excellent experiential opportunities, through the following programs, contribute to forming students' career goals:

**On-Campus Employment:** Information is available for part-time employment through work-study, student employment, and graduate assistant programs. Available opportunities are advertised on AggieCAREER Manager located on our website.

**Off-Campus Employment:** Part- and full-time jobs in Las Cruces, requiring general or very specific qualifications, are listed and referrals are made for students.

**Cooperative Education and Internship Program:** Information is available on Cooperative Education and Internship opportunities offered by government, nonprofit organizations and business/industry.

For comprehensive information on all programs and services offered by Career Services please visit us at Garcia Annex Room 224, call (575) 646-1631, or review our services online at <http://careerservices.nmsu.edu>.

## Center for Academic Advising and Student Support

The Center for Academic Advising and Student Support will be housed in Garcia Annex and new freshmen attending Aggie Welcome and Orientation this summer will be the first class to be fully integrated into the new advising center. The transition for students currently enrolled at NMSU will take effect after the beginning of the Fall 2017 semester. Leadership for the Center for Academic Advising and Student Support is Dr. Jennifer Hodges ([jphodges@nmsu.edu](mailto:jphodges@nmsu.edu)) as Interim Director and Marissa Fowler (<http://provost.nmsu.edu/advising/marissa-fowler-bio>) ([marimaci@nmsu.edu](mailto:marimaci@nmsu.edu)) as Interim Associate Director.

## Cooperative Education and Internship Program

Today's competitive employment market necessitates that students gain practical experience related to their major before they finish their college degree. This experience is a type of Experiential Learning. NMSU enjoys a national reputation for its Cooperative Education (Co-op) and Internship Program, which contributes to students' total educational experience and realization of career goals by integrating academic theory and practical application on the job. Co-op and Internship assignments provide varied work experiences with employers from business, industry, government and nonprofit organizations. All Co-op work assignments are for continuing full-time students and must be completed prior to graduation. Each semester (spring, summer, & fall) that a student participates in an approved Co-op a notation is placed on his/her permanent academic transcript.

Students may register full-time for the alternating plan, working one or more Co-op's throughout the U.S.; each Co-op will last the duration of an academic semester. Co-op's are generally separated by at least one semester of full-time on-campus classroom instruction. Note: While on an alternating Co-op, students are afforded full-time academic status with the university, which protects enrollment status, financial aid and other student eligibilities, whether they are registered for any credit or not.

Continuous academic enrollment can be maintained through the parallel plan, wherein a student works a Co-op part-time (approximately 20-29 hours per week) concurrent with full-time enrollment. Employers are generally located within commuting distance of the university.

In addition to gaining academically related work experience, Co-op students establish positive work ethics, receive remuneration for their educationally related experiences, and also may potentially arrange for course credit through an academic department.

All students interested in Cooperative Education or Internships must first register with the Cooperative Education and Internship Program office located in Career Services, Garcia Annex Room 224. Registration includes an NMSU AggieCAREER Manager Account and an advising session.

For additional information regarding the Cooperative Education and Internship Program contact or visit us at:

Garcia Annex, Room 224  
Phone: (575) 646-4115  
Website: <http://careerservices.nmsu.edu>.

## Corbett Center Student Union

Corbett Center Student Union (CCSU) serves as the center for campus life, providing programs and services for students and other members of the university community. CCSU is a place to study, relax, meet with student groups, eat, work or play; CCSU offers students, faculty, and staff and visitors a variety of services and activities. Home to several student focused administrative offices including Campus Activities, Conference Services, Associated Students of NMSU (ASNMSU), Housing & Residential Life, Campus Dining Services, Dean of Students, Tutoring Center, the student operated radio station KRUX-FM and the Round Up newspaper. Services offered include an auditorium, meeting rooms, multiple dining facilities, ATMs, a computer lab, study areas, post office, fitness center, game room and a convenience store.

For more information contact:

Corbett Center Information Desk  
MSC CC, PO Box 30001  
Las Cruces, NM 88003  
Phone: (575) 646-4411  
Email: [ccsu@nmsu.edu](mailto:ccsu@nmsu.edu) () or <http://ccsu.nmsu.edu>

## Distance Education

The Office of Distance Education extends New Mexico State University's reach beyond traditional programs to provide opportunities for students to meet their academic, professional and personal learning goals. Distance Education courses from NMSU are delivered using the most innovative technology and methods available, including web-based technologies, ITV (Interactive Television), faculty exchanges and off-site classes.

Distance Education (DE) programs are designed to serve students who live a significant distance away from the Las Cruces campus or have scheduling conflicts due to family or work obligations and often find distance education as the best solution to educational advancement. DE at NMSU is defined as the formal education process of delivering educational instruction so students physically remote from the campus of program origin and/or instructor may participate. Distance education degree programs at NMSU are delivered using a variety of formats including 100% online, or combinations of ITV, online and face-to-face instruction at the Las Cruces campus or off-site locations such as NMSU community college campuses. Visit <http://distance.nmsu.edu/degree-programs/> for a complete listing of programs.

For further information, contact the Office of Distance Education (ODE) located in Milton Hall, room 185. Contact ODE by calling (575) 646-8231, or email: [distance@nmsu.edu](mailto:distance@nmsu.edu). For current information, visit <http://distance.nmsu.edu/>.

## Bachelor's Degree Completion Programs

All undergraduate degree programs offered through NMSU-Las Cruces are bachelor's degree completion programs. These programs require that students have all lower-division (100 and 200 level) credits completed before admittance into the program. Bachelor degree completion programs normally require two years of 300 and 400 level upper-division

coursework to finish. The undergraduate degree completion programs vary in delivery format. Some are 100% online; some use web-based delivery and online; and some use online combined with face-to-face or ITV instruction at off-site locations such as NMSU community college campuses. Visit <http://distance.nmsu.edu/degree-programs/> for a complete listing of programs.

## Online Bachelor's Degree Programs

NMSU- Las Cruces partners with the NMSU Community Colleges to provide 100% online bachelor's degrees <https://distance.nmsu.edu/online-bachelors/> where the first two years are completed at the community college and the second two years are completed through the online bachelor's degree completion programs. The academic plans for the 2+2 online bachelor's degrees are aligned for a smooth transition between programs and colleges.

## Off-Site/Extension Programs

Distance education programs listed under this category are delivered primarily face-to-face at off-site/extension locations. Often, these courses will enhance instruction and learning with technology. Programs are located at NMSU two-year and Albuquerque Center campuses, as well as other locations throughout the state. Several degree programs are available at one or more off-site/extension locations. Visit <http://distance.nmsu.edu/degree-programs/> for a complete listing of programs.

## Technology-Based Programs

Distance Education programs listed under this category are delivered primarily using distance learning technologies. In some cases, programs may require brief residencies on the Las Cruces campus for orientation, assessment, or other activities. Technologies used to deliver distance education at NMSU include:

- **Instructure Canvas** - the learning management system enables instructors to utilize the Internet in the delivery of a course
- **Adobe Connect** - the web-conferencing system, offers a synchronous Web delivery solution for conducting virtual or live classroom events through the Web
- **Instructional Media Services** - provides course delivery primarily through ITV. However, a variety of synchronous and asynchronous technologies may also be used. Courses may use what is known as a "blended approach" to instruction by integrating two or more types of technologies shown above to promote engaging and effective learning.

## Edgar R. Garrett Speech and Hearing Center

Combining instruction, evidence-based practice, state of the art technology, and service, the Edgar R. Garrett Speech and Hearing Center provides training for students in Communication Disorders and renders service to the community. Students have opportunities to participate in diagnostic evaluations and to provide therapy in the areas of speech, language, hearing, cognition, and swallowing for clients across the lifespan.

Referrals are accepted from all sources (self, medical, school, nonprofessionals). The Edgar R. Garrett Speech and Hearing Center is a fee-for-service clinic where university students, staff, faculty, and their immediate family receive a reduced rate. All services are supervised by speech-language pathologists who are licensed in New Mexico and hold the Certificate of Clinical Competence in Speech-Language Pathology

or Audiology from the American Speech-Language-Hearing Association. Services are available in English and Spanish.

For further information, contact:

Edgar R. Garrett Speech and Hearing Center  
 MSC 3SPE, PO Box 30001  
 Las Cruces, New Mexico 88003-8001  
 Phone: (575) 646-3906  
 TTY: (575) 646-6191  
 web: <http://spedcd.education.nmsu.edu/cd/shc/>

## Housing and Residential Life

Living on campus is an opportunity for an investment in a student's academic success. As campus residents, students are part of the campus community with more opportunities to join clubs and attend campus events. Students are within walking distance to classes, the student union, activity center, library, bookstore and many other campus resources. The university strongly encourages students to take advantage of the many opportunities available through campus residency. Studies show that compared to their off-campus peers, students who live on campus are more likely to: maintain higher grade point averages, use campus resources, interact more with professors, and ultimately graduate on time (within four years).

### Residency Requirement

All incoming first-time, first-year students must reside in university-operated housing or complete an exemption request as part of the campus enrollment process. First-year students will be assigned to the residence halls and must reside for two consecutive semesters to satisfy this requirement. The Board of Regents approved a few reasons for students to be exempted from this requirement:

- The student is living in a structured environment provided by a parent, legal guardian, or immediate family member (as defined as a grandparent or aunt/uncle). Living with an adult sibling is not included in this exemption.
- Students residing with a spouse, domestic partner, and/or dependent child(ren).
- A student is 21 years or older, enrolled exclusively in distance education, or who are active military or veterans.
- Other extenuating circumstances including financial hardship or special medical accommodation.

Students are asked to submit specific documentation to support each of the reasons presented above. Please visit [housing.nmsu.edu/exemptions](http://housing.nmsu.edu/exemptions) (<http://housing.nmsu.edu/exemptions>) for more information.

### Application Procedures and Acceptance

To qualify for housing the student agrees to be enrolled continuously in at least half-time or more at either the undergraduate or graduate level during the fall or spring semesters as degree seeking. Completed applications for housing should be submitted as early as possible, preferably one regular semester in advance. Submission of housing application indicates acceptance of the terms and conditions of the applicable agreement. Housing applications require a deposit and fee at the time of application. Certain qualifications must be met to apply for summer housing, single student apartment and family housing. To view the various housing options visit <http://housing.nmsu.edu/options> or contact the housing office at (575) 646-3202 or Housing and Residential Life MSC 3BB, PO Box 30001, Las Cruces NM 88003-8001. Housing typically has a May 1 priority deadline for both residence hall and campus

apartment contracts. Student family housing applications are accepted on a more rolling basis.

The university will assign accommodations subject to the space available. Assignments to a particular building, type of accommodation, specific room or apartment, single room or roommate(s) are not guaranteed. The university reserves the right to change or cancel assignments in the interest of order, health, safety or discipline with appropriate written notice. The university reserves the right to deny housing to any student. Examples of reasons for denial include, but are not limited to, individuals who have criminal histories, individuals who have behavioral problems which may, in the opinion of the university, negatively impact the group-living environment, individuals who have been previously terminated from campus housing, or individuals who have poor rental histories. Student behavior expectations, rights, and responsibilities related to living in university-operated housing can be found at [housing.nmsu.edu/guide](http://housing.nmsu.edu/guide) (<http://housing.nmsu.edu/guide>).

### Availability of Units for Students with Disabilities

There are a limited number of specially equipped residence hall rooms, single student apartments and family housing units available to students with disabilities who wish to reside in campus housing. These are assigned on a first come, first-served basis. Specific needs or requirements (i.e., roll-in showers, special door openers, etc.) should be discussed with the Office of Student Accessibility Services on an individual basis prior to submitting an application.

### Residence Halls

Residence halls offer furnished, mostly suite-style rooms, large lobbies and plenty of outdoor space. Each residence hall has its own personality and environment, offering students a variety of choices while providing the amenities, social interaction and academic support. Living Learning Communities (LLCs), provide a benefit which allows members to live in the same hall and on the same floor with other students who share common academic interests. More information on the extensive offerings of LLCs can be found at [housing.nmsu.edu/llc](http://housing.nmsu.edu/llc) (<http://housing.nmsu.edu/llc>). Inclusive Housing is offered in the residence halls for those students who are Gender Variant as well as Lesbian, Gay, Bisexual, and Transitioning and Questioning. Inclusive Housing provides a living environment where a student can room with any other student regardless of sex, gender, gender identity/expression or sexual orientation. Alcohol is not permitted in the residence halls.

### Single Student Apartments

Campus apartments offer students more than just affordable housing. Campus apartments offer a unique college atmosphere where neighbors share similar goals and together form an academic community unlike any found off campus. Available for second-year to graduate students, on-campus apartments have the benefits of on-site staff, prompt maintenance and amenities such as a computer lab and laundromat. Efficiencies, one, two and four bedroom options are available and include living rooms and kitchens. Apartments are fully furnished and the semester rate includes utilities, cable TV and internet connectivity. Campus apartments feature a select number of co-ed housing options, where students may share an apartment with whichever gender they choose.

### Student Family Housing

Completed applications for Student Family Housing should be submitted at least six weeks in advance. Family Housing occupants are assigned once the application process is completed. Applications are considered incomplete and cannot be processed if requested information and supporting documents are not provided and payment of the associated

fees is not received. Family Housing applicants may select six, nine or twelve-month agreement, with thirty (30) day notice to vacate or request for renewal, prior to an expiration of the agreement. Family units include married couples, married couples with children, single parents with dependent children and domestic partners (as defined by NMSU Policy found at <http://benefits.nmsu.edu/other/domestic-partner/>). Consideration is also given to veterans and non-traditional dependent family units. As part of the application process, a criminal history check will be conducted for all adult occupants over the age of 18. Current residents will undergo a criminal history check no less than once a year. In addition, a rental payment history will also be conducted. By signing the application, you authorize New Mexico State University to conduct this process. Results of the criminal history checks and rental payment history may be shared with the applicant. Single family homes include two bedrooms, a bath, kitchen and living room. Four-bedroom units include two bathrooms, a kitchen and living room. All units offer a stove and refrigerator and are unfurnished. The monthly rent includes utilities, cable TV, and internet connectivity. Some pets are allowed in parts of Student Family Housing, reference the pet policy at <http://housing.nmsu.edu/guide>.

### **Community Development**

Housing and Residential Life develops safe and engaged communities which supporting students' efforts to achieve academic success and strong social connections at NMSU. Our live-in student (Resident Assistants) and professional staff members (Resident Directors) work to meet students' needs, and create a fun, positive experience for our residents. Residents can expect to have progressive conversations with student staff members, enjoy a myriad of social, educational, and recreational events, and engaged in community meetings and health and safety inspections. Residents are encouraged to join organizations such as community councils, Residence Hall Association (RHA) and the National Residence Hall Honorary, or Greek Life to help shape the community experience and learn more about leadership skills.

### **Books, Supplies, Parking and Transportation**

The New Mexico State University bookstore and parking office are both conveniently located at the corner of Jordan Street and University Avenue. The bookstore provides an avenue for students to obtain assistance with purchasing required books and supplies. The Parking & Transportation office assists with parking permits and transportation services questions.

## **ID Card Services**

The NMSU Aggie ID Card is the official identification card that provides access to everyday life at NMSU. The Aggie ID Card serves as a membership card for meals, Aggie Dining Dollars, Aggie Cash, Aggie Print, as a key to the residential halls, access to various buildings, carries proof of eligibility for access to athletic events and allows for other student services. This information is added to your card after registration for classes and financial arrangements have been completed. Please visit [idcard.nmsu.edu](http://idcard.nmsu.edu) (<https://idcard.nmsu.edu>) for more information.

Aggie Cash is a pre-paid account that allows you to use your Aggie ID Card to make purchases at locations all over campus. The NMSU Enhanced Aggie ID Card allows your student card to also be your Wells Fargo debit card. The ID Card Services Office in Corbett Center Student Union, Room 137 has the information and applications you will need. For more information please contact us at (575) 646-4835.

## **Information and Communication Technologies**

Information and Communication Technologies (ICT) provides the university community with the computing and communication resources and services that support the educational, research, and public service missions of the university. These resources include NMSU's central computing systems, the network that supports the systems and the wired and wireless functionality through which the Internet is accessed. ICT operates the student computer labs found throughout the Las Cruces campus; maintains and manages laptop, desktop, camera, and projector checkout and rental for students; network registration of internet connected devices which is required for access to the NMSU network; and student printing known as Aggie print. Information about specific resources are available at <http://studenttech.nmsu.edu/> ICT also provides support for all NMSU technology users through the ICT Help Desk.

For further information, contact:

Information and Communication Technologies (ICT)  
MSC 3AT, PO Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-1840  
email: [help@nmsu.edu](mailto:help@nmsu.edu)

ICT's web homepage is located at <http://ict.nmsu.edu> and the helpdesk webpage is located at <http://help.nmsu.edu/>. The helpdesk is located in room 105 of the Hardman and Jacobs Undergraduate Center.

## **National Student Exchange Program**

Under the National Student Exchange Program (NSE), students may pay NMSU tuition and attend any of 180 colleges or universities across the nation. NSE allows students to broaden their academic, social, and cultural awareness through study in different geographical settings. To qualify for the program, an applicant must be a full-time student with a 2.5 grade-point average and must be a sophomore, junior, or senior at the time of exchange. Applications for the program are accepted from October through February for the following academic year. Late applications may be accepted if space permits.

Grades and credit hours earned at the host institution become part of the official NMSU transcript upon approval of the academic advisor and records officer. Grades are recorded according to the NMSU grading system.

## **New Mexico State University Library**

The New Mexico State University Library is a Destination for Discovery that offers access to rich content and research-level collections in two library facilities located in the heart of the campus. Zuhl and Branson libraries house over 1.8 million items and provide electronic access to scholarly journals and databases for both general academic and discipline-specific research. View the large geological collection and artworks on display at Zuhl Library and explore historical collections within the Archives and Special Collections Department at Branson Library. Reference assistance and research support are provided by a team of faculty and staff dedicated to student learning and success. There are a variety of study areas available including quiet and group spaces, some of which can be reserved. Over 100 PCs, scanners, laptops, and other resources are available for students to use. More detailed information may be found at <http://lib.nmsu.edu>.

## Office of International and Border Programs (IBP)

The Office of International and Border Programs oversees the comprehensive internationalization of the university. Overseen by the Associate Provost for IBP, it is the umbrella unit responsible for the welfare and recruitment of incoming international students, outgoing education abroad students, and global learning in general. IBP also represents the university with U.S. government agencies, foreign governments, international education professional associations and the private sector concerning international activities. The office also advocates for effective curricular and co-curricular practices, policies and procedures to internationalize the university and provides programs and services to increase international understanding and awareness in the campus and local community, including southern New Mexico and northern Mexico. The major program areas are reflected in its five offices listed below, each overseen by its own Director. The offices work closely together on all aspects of internationalization.

**Office of Education Abroad** – This office oversees all study, research, internship and service abroad programs, coordinates Faculty-Led International Programs (FLiPs) that allow faculty to take NMSU students abroad on for-credit programs, and coordinates all programs and services for visiting exchange students.

**Office of International Student and Scholar Services** – This office ensures that the needs of NMSU's international students and scholars are met, and oversees all international undergraduate admissions. This includes application processing, transcript evaluation, orientation, advising and institutional compliance with U.S. Department of Homeland Security and U.S. Department of State regulations as they pertain to the F and J visa programs. The office also has an important role in facilitating international student programming and cross-cultural activities.

**Center for Latin American and Border Programs** – This center is responsible for strengthening the university's involvement in US-Mexico and Latin American cooperative projects including research, economic development and educational outreach.

**Center for English Language Programs** – This office provides all intensive English language training for the NMSU community. CELP prepare students for matriculation into regular degree programs, and also engages in international contracts for special English training programs.

**Confucius Institute** – This institute is dedicated to increasing awareness and understanding of Chinese language and culture in the community through education. The CI provides teachers and instructional materials for K-16 Chinese language instruction, as well as through performances, seminars, and community outreach. The Institute is a joint project supported by both NMSU and the Hanban/Confucius Institute Headquarters, which is a public institution affiliated with the Chinese Ministry of Education.

## The Office of Education Abroad

This division of International and Border Programs is the international education program development and coordination unit that assists colleges and departments with integrating study abroad into the undergraduate and graduate curriculum. It manages support services for outbound study abroad students and inbound international exchange students and coordinates all international partner exchange agreements, intensive language immersion and faculty-led programs as well as all credit-bearing international research, service and internships. The division

also sponsors the Study Abroad Ambassadors Club, a chartered student organization that provides support to international exchange students at NMSU. Additionally, the Office of Education Abroad works closely with Housing and Campus Life to provide leadership and oversight for the Global Village Living and Learning Community.

All NMSU students, including community college students, may apply to study abroad while maintaining NMSU student status to receive regular course credit through Faculty Led Programs, international distance education language credit and teacher education credit (graded A+ through F), and/or receive transfer credit (graded CR) per regular NMSU transfer credit guidelines. For most exchanges with international partner institutions, students must have completed two full semesters of university study, maintained a 2.75+ grade-point-average, and obtained permission of their college to receive transfer credit. For other programs, students must be in good standing academically at NMSU, and receive permission to enroll from the course instructor or program coordinator. International Business majors must receive permission from their department for study abroad to count as required in their degree plan. At least four weeks of a study abroad program may count for a waiver of 3 credits of Viewing the Wider World (<http://oea.nmsu.edu>).

## Parking Office

NMSU requires a parking permit to park in campus parking lots or curbside on streets. Parking meters require payment. Free parking is available near the Pan American Center. The campus parking map is available online at [park.nmsu.edu](http://park.nmsu.edu) (<http://park.nmsu.edu>). Parking regulations are enforced between the hours of 7:30am - 4:30pm. Disabled parking spaces, emergency/fire zones, service zones and yellow curbs are enforced 24 hours a day. The campus parking map and Parking Regulations are available at [park.nmsu.edu](http://park.nmsu.edu) (<http://park.nmsu.edu>).

Information on purchasing a parking permit is also available by phone at 575-646-1839, by email to [parking@nmsu.edu](mailto:parking@nmsu.edu) (), online at [park.nmsu.edu](http://park.nmsu.edu) (<http://park.nmsu.edu>) or at the Parking Department located at 1400 E. University Ave. (southwest corner of the Auxiliary Services building between Barnes & Noble and Panda Express) Monday through Friday from 8am - 4:30pm. When visiting the Parking Department, you may park for free in designated spots just south of the building. Aggie Transit is a free campus shuttle service available to all students. Bus route maps are available at [park.nmsu.edu](http://park.nmsu.edu) (<http://park.nmsu.edu>).

Transportation and Parking Services is responsible for issuing parking permits, enforcing parking regulations and developing parking lots as well as maintaining information related to the university fleet.

## Student Accessibility Services

In compliance with the federal regulations outlined in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 2008, NMSU is committed to providing accommodations and academic adjustments to ensure equal access for students with disabilities. Students who wish to request an accommodations or academic adjustment for face-to-face and online classes, practicums and internships must follow the established procedures for self-identification by completing the intake process with Student Accessibility Services (SAS).

For more information, please visit the SAS office in Corbett Center Student Union:

Room. 208  
MSC 4149, PO Box 30001

Las Cruces, NM 88003-0001  
 (575) 646-6840  
 Email: sas@nmsu.edu  
 http://sas.nmsu.edu

## Student Success Centers

New Mexico State University offers a variety of learning assistance, and tutorial services via the Student Success Center. The Student Success Center provides services to assist NMSU students in reaching their academic potential. The Student Success Center provides study skills assistance in such areas as: time management; memory; concentration; note taking; reading; test preparation; test taking; math; science; speed reading; critical thinking; financial wellness, as well as graduate school and professional skills test preparation. The services are available to students in the following formats:

1. Individualized assistance is provided to any student who walks in at the Student Success Center
2. Academic credit is offered under
 

UNIV 110	Personal Learning Skills I	1-3
UNIV 112	Academic and Personal Effectiveness	2
UNIV 113	Speed Reading	1
UNIV 114	Financial Literacy Money Matters	2
UNIV 150	The Freshman Year Experience	3
UNIV 300	Preparing for the Graduate Record Examination	1
UNIV 350	Peer Education	3
UNIV 395	Independent Study	1-3
3. Learning strategies and study-skills workshops provide quick assistance in one-hour presentations offered throughout the semester.
4. Professional and graduate school workshops provide development in such areas as speed reading, preparing for graduate school, preparing for the GRE, GMAT, LSAT, MCAT, or NES Test.
5. Student Success Center staff provide outreach presentations on learning and study-skills topics to classes, programs and organizations on campus.
6. Individual and group financial wellness services are provided through the Red to Green Financial Wellness Program.

For comprehensive information on all programs and services offered by the Student Success Center please visit us at the Hardman and Jacobs Undergraduate Learning Center Room 128, call (575) 646-3136, or review our services online at <http://ssc.nmsu.edu>.

## Sustainability Courses at NMSU

The following courses have been identified as being Sustainability-Focused. These courses may be used to attain an 18 credit minor in a sustainability related discipline offered in the departments of

- Anthropology (p. 182),
- Engineering Technology (p. 605),
- Management (p. 456) and
- Plant and Environmental Sciences (p. 147).

AG E 315V	World Agriculture and Food Problems	3
AG E 337V	Natural Resource Economics	3
AG E 384V	Water Resource Economics	3

AGRO 100G	Introductory Plant Science	4
AGRO 483	Sustainable Production of Agronomic Crops	4
AGRO 515	Crop Physiology	3
ANTH 362	Environmental Anthropology	3
ANTH 538	Plants, Culture, and Sustainable Development	3
BCIS 502	Business Information Systems	3
BIOL 301	Principles of Ecology	3
BIOL 462	Conservation Biology	3
BLAW 530	American Indian Law and Policy	3
CHME 330	Environmental Management Seminar I	1
E S 110G	Introductory Environmental Science	4
E T 300	Special Topics	1-3
E T 381	Renewable Energy Technologies	3
E T 386	Sustainable Construction and Green Building Design	3
E T 400	Special Topics	1-3
ECDV 671	Sustainable Economic Development	3
ECON 337V	Natural Resource Economics	3
ECON 384V	Water Resource Economics	3
EPWS 380V	Science & Society	3
FWCE 255	Principles of Fish and Wildlife Management	3
GEOG 315V	World Agriculture and Food Problems	3
HON 305V	Global Environment	3
HORT 100G	Introductory Plant Science	4
HORT 315	Crop Physiology	3
HORT 485	Vegetable Crop Management	4
HRTM 430	Hospitality Facilities Management	3
HRTM 450	Special Topics	1-4
HRTM 492	Special Problems	1-4
MGT 375V	Global Environmental Assessment and Management	3
MGT 388V	Leadership and Society	3
MGT 448	Small Business Consulting	3
MGT 449	Strategic Management	3
MGT 458	Comparative International Management	3
MGT 465	Contemporary Issues in Human Resources Management	3
MGT 548	Small Business Consulting	3
MGT 590	Strategic Management	3
MGT 591	Seminar in Entrepreneurship	3
MGT 655	Seminar in Organizational Systems and Theory	3
SOC 465V	Environmental Sociology	3
WERC 330	Environmental Management Seminar I	1

## Testing Services

Testing Services provides test information and registration materials for the following tests:

- American College Testing Assessment (ACT);
- College Level Examination Program (CLEP);

- High School Equivalency (HSE) (GED/HiSET);
- Graduate Record Exam (GRE);
- Miller Analogies Test (MAT);
- Pearson VUE Test Site;
- PRAXIS Series;
- Pre-Professional Skills Test (PPST);
- New Mexico Teacher Assessments;
- and others.

For more information contact:

Testing Services  
 MSC 3DA, PO Box 30001  
 Las Cruces, NM 88003  
 Phone: (575) 528-7294  
<http://dacc.nmsu.edu/testing>

## TRIO Student Support Services Program

The TRIO Student Support Services program offers academic and social support to ensure that program participants succeed at New Mexico State University. TRIO SSS uses a holistic approach in providing essential services to participants. Services include tutoring, mentoring, and strategies to assist participants in reaching their academic potential. Tutors and Mentors are certified by the College Reading and Learning Association (CRLA) assist participants with tutoring, developing study strategies, adjusting to college, learning and using campus resources, developing effective study skills, accessing financial aid, using academic peer pre-advising, staying motivated and dealing with personal issues associated with college.

To qualify for the program, students must be a first generation college student (neither parent received a four-year baccalaureate degree), meet income guidelines set by the US Department of Education, demonstrate an academic need or have a learning or physical disability. Admission to the TRIO Student Support Services is highly competitive with only 350 slots available for eligible students.

For comprehensive information on program services offered by the TRIO Student Support Services Program please visit at the Student Success Center located in the Hardman and Jacobs Undergraduate Learning Center Room 128, call (575) 646-1336, or review our services online at <http://triosss.nmsu.edu>

## Undergraduate Research Programs

New Mexico State University has a variety of faculty-mentored undergraduate research programs that offer students the opportunity to demonstrate knowledge gained within the classroom and apply it to scholarly research projects. In addition to offering the opportunity to write an honors thesis and work individually with faculty members through an independent study project is a sample sub-set of research programs available to undergraduates:

- Aggie Innovation Space
- Building Research Achievement in Neuroscience (BRAiN)
- Fred Hutchinson Partnership for the Advancement of Cancer Research Project
- Howard Hughes Medical Institute (HHMI)
- iCREDITS Center
- New Mexico Alliance for Minority Participation (AMP)

- Maximizing Access to Research Careers (MARC)

## Graduate Research Facilities

The University recognizes and supports the concept of off-campus study and research as a valuable experience for graduate students. These experiences may take the form of internships, intensive study of specialized techniques with personnel at other institutions, and conducting research at specialized research facilities. Arrangements for such off-campus activities should be made with the student's committee and the graduate dean and should represent opportunities not normally available at this university. When the bulk of a student's research is to be conducted off-campus, both on- and off-campus advisors should be appointed and periodic meetings with the student's committee held to ensure timely progress. Such opportunities offer students considerable flexibility in their training and promote valuable contacts between the student, the university, industry, and research institutions. Students are encouraged to pursue these opportunities with their advisors and the graduate dean.

## Agricultural Experiment Station

The Agricultural Experiment Station is the research division of the College of Agricultural, Consumer and Environmental Sciences. Faculty, professional personnel, and graduate students conduct basic and applied research concerned with biological, physical, and economic phases of food and fiber production, processing, and distribution; consumer health and nutrition; and the social and economic aspects of rural living. Energy, environmental, and natural resource conservation aspects of these broad disciplines offer many opportunities for the graduate student to undertake meaningful research investigations in both the laboratory and the field.

There are eight departments on the main campus with excellent laboratory facilities for research. In addition, the station maintains 13 field research centers including eight agricultural science centers, a forestry research center, a livestock research center, an animal insect lab, and two research ranches.

The station provides financial support to graduate research assistants and cooperates with research institutes at the university and with various state and federal agencies in providing opportunities for graduate research programs covering a wide scope of student interests. For further information, contact [aesdean@nmsu.edu](mailto:aesdean@nmsu.edu) or visit <http://aces.nmsu.edu/aes/>.

## Apache Point Observatory (APO-ARC)

Apache Point Observatory (APO) is located in the mountains of south-central New Mexico and is operated by New Mexico State University. The observatory is a major astronomical research facility that is home to four telescopes. The largest is a fully equipped 3.5-meter telescope that can be used for optical and infrared imaging, photometry, and spectroscopy. Apache Point Observatory is also the site of the Sloan Digital Sky Survey 2.5-meter telescope, which is running several different wide-field surveys touching on many facets of astronomy. NMSU owns and operates a 1-meter telescope at APO for wide field imaging. There is also a 0.5-meter telescope at the site.

Apache Point Observatory is owned by the Astrophysical Research Consortium (ARC). The consortium members include: New Mexico State University, the University of Colorado, the University of Virginia, the University of Washington, Georgia State University and Johns

Hopkins University. NMSU manages and operates the observatory for the ARC consortium. Astronomy faculty and graduate students use the facility for various research projects. For further information, e-mail [astro@nmsu.edu](mailto:astro@nmsu.edu).

## Arts and Sciences Research Center

The research center is the coordinating office for all scholarly activities within the College of Arts and Sciences. The primary functions are service to departments and faculty members, and the administration of grants and contracts. The center encourages and stimulates individual research and creative efforts in all areas of the college, and it facilitates the development of potential research programs within the college, and with other colleges, institutes, the Physical Science Laboratory, and external organizations. The center assists individual faculty members by providing small grants of "seed" money. Typically, support services fall within, but are not limited to, the following areas:

- Location of funding sources
- Administration of grants and contracts
- Financial management of grants and contracts
- Liaison with the Office of the Vice President for Research

Contact: Olga Ostos at [ostos@nmsu.edu](mailto:ostos@nmsu.edu)  
<http://www.nmsu.edu/~artsci/Research/center.html>

## Bioinformatics Research Lab

The bioinformatics research lab develops efficient computational and statistical methods to model mechanisms of complex biological systems. The lab's work rigorously evaluates both the theoretical and practical effectiveness of computational methods for characterizing molecular interactions from high-throughput measurements such as next generation sequencing data. The lab's long term goal is to invent advanced computational technology to expedite quantitative understanding of the complexity of life processes.

Director: Joe Song  
<https://www.cs.nmsu.edu/~joemsong/group.shtml>

## Biology Research Facilities

The Department of Biology houses multiple core facilities and individually faculty-maintained research laboratories that have been successful in the acquisition of millions of dollars in research grants from the NIH and NSF, as well as other agencies. The facilities and equipment include a cell culture facility, insect and invertebrate rearing and microbiology culturing facilities, diverse microscopy laboratories, as well as a well-maintained herbarium and vertebrate museum holding more than 100,000 specimens from our region and beyond. Individual research laboratories are equipped to investigate organismal genomics, transcriptomics, and microbiome analysis; organismal and microbial evolutionary mechanisms and physiology; vaccine development; host-symbiont interactions; cell mitosis and cytokinesis; plant pathology; neuronal and muscular tissues; animal vocalization and behavior; computational modeling of biological phenomena; and molecular systematics.

Contact: Dr. Ralph Preszler ([rpreszle@nmsu.edu](mailto:rpreszle@nmsu.edu))

## Bureau of Business Research and Services

Founded in 1969, the bureau has two basic objectives. The first is to provide business and economic research services to both public

and private sectors of the state, the region and the nation. Research capabilities in the behavioral and managerial sciences, business systems, economic and social sciences, marketing, statistical design and analysis and regional planning can be applied to problems relating to economic growth, business development and community needs in New Mexico.

The second objective of the bureau is to provide management training services to business organizations and associations, to government agencies, and to the public as well. Management development seminars, training programs, and analytical services are designed to meet specific organizational needs.

The Bureau of Business Research and Services is a member of the Association for University Business and Economic Research.

Contact: Dr. William Gould ([wgould@nmsu.edu](mailto:wgould@nmsu.edu))

## Carlsbad Environmental Monitoring and Research Center

Created in 1991 with a grant from the U.S. Department of Energy, the Carlsbad Environmental Monitoring & Research Center (CEMRC), a department of the College of Engineering, conducts environmental research, provides special analytical services, assists with technology development, and disseminates information for federal, state, and private sponsors. CEMRC is housed at Light Hall, a 26,000-square-foot facility located in Carlsbad, in southeast New Mexico. The facility's laboratories include radiochemistry and associated nuclear spectroscopy, environmental organic and inorganic chemistry, in vivo bioassay, and field sampling. A primary activity of CEMRC is long-term environmental monitoring for contaminants in the region of the Waste Isolation Pilot Plant (WIPP), located near Carlsbad. The data produced from this project are summarized in periodic reports and are presented on the CEMRC web site at [www.cemrc.org](http://www.cemrc.org) (<http://www.cemrc.org>). Primary research areas of the CEMRC include studies of atmospheric dust and inorganic contaminants, human and ecological risk assessment, and development of radioanalytical and spectroscopic methods for measurement of naturally occurring and human-produced radioactive elements. Results of CEMRC research projects appear in peer-reviewed scientific journals and are presented at national and international meetings.

Contact: Dr. Russell Hardy at (575) 234-5555

## The Center for Animal Health and Food Safety

The Center was founded in 2007 and is comprised of three primary functional research units:

1. Chemical Analysis and Instrumentation Laboratory maintains high-end analytical instrumentation which is available to support collaborative research within NMSU, the State of New Mexico and other educational or industrial partners.
2. Food Safety Microbiology Laboratory specializes in research and development of foodborne pathogen detection and control; food product testing, including microbiological analyses, pH, aw; process evaluation of acidified foods, inoculation studies, shelf-life testing, and contracting to establish food safety plans (e.g. HACCP plans, *Listeria* control programs).
3. Veterinary Entomology Research Laboratory provides a state-of-the-art large animal research facility located on 45 acres, with a 5000 sq. ft. large animal laboratory, capable of housing 24 animals individually in environmentally controlled rooms. The laboratory maintains

multiple insect rearing facilities for major ectoparasites including: house flies, stable flies, horn flies, face flies, mosquitoes, lice, mites and ticks. The facility has outdoor housing for 60 large animals in covered, individual outdoor stanchions, in addition to housing for wildlife species including: deer, elk, bighorn sheep and rabbits.

Director: Dr. Tanner Schaub (tschaub@nmsu.edu; (575) 646-5156)

## Center for Latin American and Border Studies

The Center for Latin American and Border Studies (CLABS) was established in 1979 by the College of Arts and Sciences and is located at the Nason House. CLABS supports *Frontera NorteSur*, an on-line journal about the U.S.-Mexico border. In addition, CLABS supports the collection at the NMSU library, travel for faculty to conferences, language training in Spanish and Portuguese, lectures by visiting speakers, curriculum development for teachers, the student Latin American organization, and other outreach activities. It has a faculty governance organization and helps administer the Nason foundation fund. In recent years the center has pursued an active program of research on U.S.-Mexico border policy issues, in cooperation with several universities in the United States and Mexico.

Contact: Center for Latin American and Border Studies 575-646-7041.

## Chemistry and Biochemistry Research Facilities

The Department of Chemistry and Biochemistry has a comprehensive equipment base that supports research in nearly all phases of chemistry. It also has instrumentation dedicated to the department's teaching mission. Major instruments supporting both missions include five nuclear magnetic resonance (NMR) spectrometers ranging from low field (200 MHz) to high field (500MHz), two atomic absorption spectrometers, several UV-Vis spectrometers, two mass spectrometers (LS/MS) and four gas chromatograph instruments. Details about all instruments located in the department's facilities can be accessed at [http://www.chemistry.nmsu.edu/instrumentation/NMSU\\_MainInstrument.html](http://www.chemistry.nmsu.edu/instrumentation/NMSU_MainInstrument.html).

Instrumentation Facilities Manager: Jaime Rodriguez (jarodrig@nmsu.edu)

## Cooperative Extension Service

As a land-grant institution, New Mexico State University has a tripartite mission—instruction, research, and extension. The three parts of this mission are closely interrelated and mutually reinforcing. New Mexico State University's Cooperative Extension Service serves a unique role in New Mexico. As the state's land-grant university, and as mandated by its charter, it is the "leading object" for agriculture, home economics, engineering, business, health sciences, as well as educational programs in the liberal arts and natural sciences. NMSU's uniqueness arises from its vision of teaching/learning, research, and extension/outreach functions—interdependent, mutually supportive and central to its land-grant mission.

The extension aspect of the university's mission is the process of extending the intellectual expertise and resources of the university through teaching and applied research to address the social, civic, economic and environmental challenges and opportunities facing our state, region, nation, and global community. Extension entails an organized and planned program of activities; these activities bring the

resources of the university to bear in a coherent and strategic fashion for the benefit of the citizens of New Mexico and the nation. Many faculty have split appointments with the Agricultural Experiment Station and serve as graduate advisors for students interested in extension as a career. For more information see <http://extension.nmsu.edu/>.

## Core University Research Resources Laboratory

The Core University Research Resources Laboratory (CURRL) is a campus-wide, core facility providing all levels of technical support and consultation for investigators needing analytical and routine transmission, scanning electron microscopy, and light microscopy services. The integrated imaging facility is administered through the Office of the Vice President for Research and is considered a core research facility. The facility was established to furnish state-of-the-art microscopy instrumentation and techniques to investigators and their students for research and training. The laboratory is located in Skeen Hall, RM W152, and W160.

Director: Dr. Huiyao Wang (huiyao@nmsu.edu)

## Data Management and Data Analysis (DATA) Research Lab

The Data Management and Data Analysis (DATA) research lab aims at advancing techniques for the effective management and analysis of complex data (e.g., sequence data, graph data, semi-structured data). The laboratory conducts research in modeling, storing, querying and mining large amount of complex data at both theory and application levels. The laboratory keeps active collaborations with scientists from other Computer Science areas and scientific disciplines to broaden the usage of data management and data mining techniques. The laboratory is located in Science Hall, Rm. 153.

Director: Huiping Cao  
<https://kddlab.nmsu.edu/>

## Dissect Laboratory

DISSECT (Discovering Science through Computational Thinking) is a laboratory established by a joint team of researchers from the Department of Computer Science and the College of Education. The lab is housed in Computer Science on the second floor of the Science Hall. DISSECT provides physical space and facilities to nurture interactions between computational scientists and educational researchers in order to develop innovative technologies that will expose K-12 students to fundamental principles of computing. The laboratory provides workspaces and high performance workstations for graduate students as well as a dedicated network and offices for researchers and visitors.

Director: Dr. Enrico Pontelli (epontell@cs.nmsu.edu).

## Educational Research Center (EDRC)

The Educational Research Center (EdRC) in the College of Education is the administrative office which supports faculty in obtaining and managing external funding. The academic which supports faculty in obtaining and managing external funding. The academic component of the ERC, under the direction of the Associate Dean for Research, facilitates faculty involvement in research, publishing and outreach initiatives with the goal of building a strong research agenda for the college. The business component of the ERC is the Education Research and Budgeting Office (ERB) which assists in proposal submission,

account setup and monitoring and provides oversight for the College's unrestricted, restricted and legislative funds.

ERB Director: Juanita Hannan (juamendo@nmsu.edu)

## Engineering Research Center

The mission of the College of Engineering's Engineering Research Center (ERC) is to support the faculty and staff of the college in building research programs of nationally and internationally recognized excellence. The ERC assist faculty and staff in their pursuit of research funding, management of their research, and in ensuring research activities are in compliance with all relevant laws and regulations.

The ERC disseminates information to the college regarding state, national and international research trends, programs and policies. The ERC identifies potential funding opportunities and calls for proposals that may be a fit for college faculty and staff. The ERC works with the Office of the Vice President for Research and the other NMSU colleges to bring together multi-disciplinary teams.

Engineering Research Center for Bio-Mediated and Bio-Inspired Geotechnics (CBBG), Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt), and Tran-Set: Transportation Consortium of South-Central States.

For proposal preparation, the ERC pre-award team assists the faculty with interpretation of sponsor guidelines, development of the proposal budget, completion of standardized forms, review of the proposal for adherence to sponsor requirements, and submission to the NMSU Office of Grants and Contracts for their review and final submission. The post-award staff assist the faculty and staff with award management, including working with the NMSU Sponsored Projects Accounting office. The ERC is responsible for financial management of college grants and contracts.

Contact: Dr. Phillip DeLeon (pdeleon@nmsu.edu)

## Freeport-McMoran Copper & Gold Water Quality Laboratory

The Water Quality Laboratory in the College of Engineering was established by a gift from Freeport-McMoRan. It is located in ECIII rooms 106 and 110. Current capabilities of the lab include:

- Dionex ICS-2100 Ion Chromatographic System (ICS) with an AS-DV autosampler, the ICS-2100 is configurable for either anions or cations;
- PerkinElmer Elan DRC-e Inductively Coupled Plasma for Mass Spectrometry (ICP/MS) with dynamic reaction cell (DRC) capability;
- Perkin Elmer Series 200 High-Performance Liquid Chromatography (HPLC) with UV/Vis Detection;
- Gas Chromatography (Agilent model 7890) using a mass spectrometer detector (Agilent model 5975C) (GC/MS) using an Agilent 7693 autosampler;
- A 16-vessel Multiwave 3000 Microwave Reaction System by Anton Paar;
- Micromeritics ASAP 2050 High Pressure Sorption Analyser that uses a dewar with liquid nitrogen or antifreeze for temperature control. The antifreeze temperature is controlled from -20° to +75° Celsius using a PolyScience PD1 5R-30 recirculator bath;
- Shimadzu TOC-Vcsh Total Organic Carbon Analyser (TOC) with a Total Nitrogen Measurement Unit (TNM-1) option;

- Malvern Zetasizer Nano ZS for zeta potential and size measurement of suspended particles;
- Anton Paar Surpass for zeta potential measurement of membranes, granules, or fiber particles; and
- a Millipore Direct Q3 water purification system.

Analyses may be performed by a researcher after receiving training on the device.

Contact: Dr. Phillip DeLeon, pdeleon@nmsu.edu ()

## Geochemistry Research Laboratory

The Department of Geological Sciences houses a number of analytical instruments, all of which are available for use by graduate students, undergraduate researchers, and faculty. The department houses a Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometer (LA-MC-ICPMS) for analysis of isotopic ratios of microsamples, an X-ray fluorescence spectrometer for geochemical analysis of rocks and other solid materials, a thermal ionization mass spectrometer for analysis of isotopic ratios of solids and liquids, and a laser-induced breakdown spectrometer for the analysis of solid materials. Sample preparation equipment is available to support research on these instruments. In addition, mineral separation equipment including a jaw crusher, Gemini shaker table, Franz magnetic separator, and heavy liquids, is available for geochronologic or other mineralogic research projects.

Contact: Dr. Nancy McMillan (nmcmillan@nmsu.edu)

## ICredits: Interdisciplinary Center of Research Excellence in Design of Intelligent Smartgrids Technologies

The Center, funded through a grant from the National Science Foundation, is focused on the development of novel hardware/software technologies and methodologies to enable the design, development, deployment and evaluation of microgrids and smartgrids. The Center is housed in Science Hall; it supports research activities at the boundaries between power systems and computer science. The Center also promotes the development of educational and outreach activities aimed at enhancing the awareness and training in all areas relevant to the smartgrids vision.

Contact: Dr. Enrico Pontelli (epontell@nmsu.edu)

## Institute for Energy and the Environment

The Institute for Energy & the Environment (IEE) is a unit within the Engineering Research Center IEE's programmatic efforts focus on interdisciplinary research, education, and outreach to develop comprehensive solutions for environmental, energy and water challenges in the southwestern United States and worldwide. IEE offers opportunity for conducting research to the graduate and undergraduate students at NMSU. IEE's major objectives include renewable energy, biofuel, advanced water treatment and desalination, and advancing education, training and outreach in areas of environment, energy and water.

Director: Dr. Phillip DeLeon (pdeleon@nmsu.edu)

## Knowledge Representation, Logic and Advanced Programming Laboratory (KLAP)

The KLAP lab was established in 1994 through an RIMI grant from the National Science Foundation and has developed into a focal research laboratory of international reputation. It is housed in the Department of Computer Science. KLAP's research focus is to advance state-of-the-art knowledge in Artificial Intelligence and High Performance Computing and its application in diverse interdisciplinary domains such as bioinformatics and assistive technologies.

The lab provides a full meeting space (with multimedia projection capabilities), access to eight high performance work stations, a dedicated high performance computing server and a 40-core Infiniband Beowulf cluster. The lab has hosted international researchers and has graduated approximately 100 graduate students with MS and Ph.D. degrees. It has attracted almost \$10,000,000 in external funding.

Director: Dr. Enrico Pontelli (epontell@cs.nmsu.edu)

## Networks and Systems Optimization Lab (NSOL)

The Networks and Systems Optimization Laboratory (NSOL) supports research in networking and communication including, but not limited to: wireless networks, the Internet, supercomputing networks, and online social networks. This research includes optimization problems, protocol design and development, hardware design and development, and mechanisms for improving security and privacy of communications (including cybersecurity). The lab has a 24 core blade server (RAID-10) that is used for extended simulations and back-up, five desktops, five laptops, and four smartphones, which form a networking testbed.

Director: Satyajayant "Jay" Misra  
<http://nsol.nmsu.edu/>

## New Mexico Department of Agriculture

The New Mexico Department of Agriculture (NMDA), under the control of the NMSU Board of Regents, is responsible for administering laws and regulations that daily affect the lives of every citizen of the state. These laws and regulations (concerning the production, preparation, processing, sale, and use of agricultural products; weights and measures; and petroleum products) are designed to assist producers, processors, and consumers. NMDA's marketing program provides guidance to commodity groups in the promotion of agricultural products. A broad consumer service in many areas other than agriculture is provided by the department. NMDA's director is New Mexico's secretary of agriculture and serves on the governor's cabinet as a liaison between state government and the agricultural industry. For further information, e-mail: <mailto:pio@nmda.nmsu.edu> (pio@nmda.nmsu.edu). NMDA's web site is at <http://www.nmda.nmsu.edu>

## New Mexico State University Library

The New Mexico State University Library is a Destination for Discovery that offers access to rich content and research-level collections in two library facilities located in the heart of the campus. Zuhl and Branson libraries house over 1.8 million items and provide electronic access to scholarly journals and databases for both general academic and discipline-specific research. View the large geological collection and artworks on display at Zuhl Library and explore historical collections

within the Archives and Special Collections Department at Branson Library. Reference assistance and research support are provided by a team of faculty and staff dedicated to student learning and success. There are a variety of study areas available including quiet and group spaces, some of which can be reserved. Over 100 PCs, scanners, laptops, and other resources are available for students to use. More detailed information may be found at <http://lib.nmsu.edu>.

## New Mexico Water Resources Research Institute

The New Mexico Water Resources Research Institute (WRRI) at NMSU, established in 1963, was one of the first of 54 water institutes in the United States. The WRRI program encompasses all state universities in New Mexico and public agencies sponsoring water research. The institute serves as a coordinator, assisting researchers in obtaining funds, working with granting agencies, and serving as the administrator for projects. The annual budget of approximately \$1.5 million is made available from federal, state, and/or private sources through a variety of grants and contracts. All research projects administered by the institute encourage graduate student participation. As a result, about 30 students a year receive scientific training through institute-sponsored projects. WRRI also sponsors the Annual New Mexico Water Conference, which has provided a public forum for state water issues since 1956. Public participation helps the institute focus its research program on areas of greatest need. The WRRI publishes research results of every project it administers and other miscellaneous reports. The WRRI also maintains a water resources reference room with 2,000 books and documents and the ability to link to 10,000 water-related documents on water issues facing the state and the nation. E-mail may be sent to [nmwrrri@nmsu.edu](mailto:nmwrrri@nmsu.edu). The WRRI's homepage address is <http://nmwrrri.nmsu.edu/>.

## Oak Ridge Associated Universities Program (ORAU)

Since 1991, students and faculty of New Mexico State University benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 98 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at <http://www.orau.gov/orise/educ.htm>, or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact:

Dr. Luis Vazquez - Interim Vice President for Research (575) 646-2481

ORAU Corporate Secretary (865) 576-3306; or Visit the ORAU Home Page (<http://www.orau.org>)

## Physics Research Facilities

The Department of Physics operates a PANalytical Empyrean x-ray diffractometer for low-resolution powder diffraction, high-resolution diffraction, reciprocal space mapping with a triple-axis crystal, and x-ray reflectance. It also operates a J.A. Woollam variable angle of incidence ellipsometer (VASE) with a computer-controlled Berek waveplate compensator for measurements from 190 to 2500 nm, at room temperature and from 80 to 800 K. Both instruments are integrated into CURRL and available to the campus community and off-campus users for a fee. See <http://xrd.research.nmsu.edu> and <http://ellipsometry.nmsu.edu> for more information and to book time on the instruments.

Contact Dr. Stefan Zollner ([zollner@nmsu.edu](mailto:zollner@nmsu.edu)).

## Play and Interactive Experiences for Learning Lab (PIXL)

The Play and Interactive Experiences for Learning (PIXL) Lab works at the intersection of games, human-computer interaction, and mixed reality, developing game experiences that educate and function as scientific experiments in HCI. Projects center around the best means of interfacing with games, including keyboard and mouse and controllers all the way to gesture-based input, wearable systems and mixed reality. Prior research has investigated the use of games for training firefighters, and ongoing research applies this to disaster response in general and military projects. The lab provides space for students, as well as access to workstations, a modular wearable computer, tracking sensors and games.

Director: Zachary O. Dugas Toups ([ztoups@nmsu.edu](mailto:ztoups@nmsu.edu))

## Programming Languages Environments and Software Engineering (PLEASE) Laboratory

The PLEASE lab pursues research in the practical aspects of software development, including programming languages, programming environments, and software engineering. The lab is housed in Science Hall 167 and includes workstations and work space for graduate students pursuing research in relevant areas.

Director: Jonathan Cook  
<http://www.cs.nmsu.edu/please>

## Psychology Research Facilities

The Department of Psychology emphasizes research in social psychology, engineering psychology, and cognitive psychology. Faculty investigate such issues as mother-infant interactions and the impact of cortisol responses to stress upon development; visual search; human factors research; auditory perception; prospective memory; emotion and social decision-making; evolutionary psychology; skill acquisition; social cognition; perception and action; embodied cognition; cognitive neuroscience (control of attention, neural dynamics; and brain-computer interfaces); and research and statistical analysis methods.

All faculty have designated labs with a large central area and 3-4 smaller adjacent rooms. This facilitates data collection from small groups or individuals. Research using the department's subject pool is managed with an online system.

The department has specialist facilities that include an EyeLink 1000 eye tracking system with experiment builder software; two 128 channel Biosemi ActiView-2 EEG systems and two shielded rooms; eight analysis workstations; and a Neuroconn DC Stimulator Plus tDCS stimulator. The lab collaborates with the Mind Research Network that has access to a Siemens 3T Trio research MR scanner, a Magvis 132 channel MEG system, and Biosemi and Geodysics EEG systems. The Auditory Perception Lab has a remote-controlled robot with binocular vision and stereo audition that is used to assess auditory performances in applied settings; another remote controlled robot to test perceptual interfaces for remotely-operated vehicles; a 30-element speaker array to simulate real-world auditory environments; and two portable eye trackers housed in the PACMANE (Perception, Action and Cognition in Mediated, Artificial and Naturalistic Environments) lab.

Contact: Dr. Dominic Simon ([domsimon@nmsu.edu](mailto:domsimon@nmsu.edu))

## Research Initiatives in the College of Education

The College of Education has research initiatives and labs in the following areas:

- The Kinesiology and Dance Department offers lab space for the study of biomechanics, sport psychology & motor learning, applied and basic physiology, healthy aging, physical education curriculum and kinesthetic learning.
- The Speech and Hearing Center's Benfer for voice and speech science research.
- The Special Education/Communication Disorders Department's Autism Research Initiative.
- Alliance for the Advancement of Teaching and Learning in collaboration with the Southwest Regional Educational Lab REL (Institute for Educational Services, IES) provides research for partner school district practitioners on accountability, special education/response to intervention, literacy, leadership development, math and science achievement, and program evaluation.
- The Institute for Mathematics and Science Education oversees multiple mathematics and science grants as well as serving as the STEM Outreach Center for K-12 education.
- The Counseling and School Psychology Training and Research Center provides counseling services for students, training for graduate students in counseling, school psychology and counseling psychology, and conducts research on counseling outcomes and processes.

- A Reading Research Center is housed in the NMSU Children's Village and provides reading diagnostic services including analysis of reading using eye-tracking software.

## Southwest Institute for Health Disparities Research

To address the substantial health disparities that exist in Southern New Mexico and the U.S./Mexican Border Region, New Mexico State University has recently established the Southwest Institute for Health Disparities Research within the College of Health and Social Services. The purpose of the Institute is to assist faculty to secure external funding and conduct research which has the potential to reduce health disparities and improve minority health, provide health related community outreach programming, provide training for researchers, lay groundwork for additional funded research, and attract highly qualified minority faculty and graduate students to NMSU. Additionally, the Institute serves as the coordinating office for all scholarly activities within the College of Health and Social Services <http://swihdr.research.nmsu.edu/>.

Dr. Jill McDonald ([jillmcd@nmsu.edu](mailto:jillmcd@nmsu.edu))

## Southwest Technology Development Institute (SWTDI)

SWTDI, formally the SouthWest Regional Experimental Station or SWRES, was established in 1977 under DOE funding as a Photovoltaic research center. Over the last 30 years SWTDI has conducted extensive long term panel, inverter, and systems testing providing significant contribution to the field. One substantial consequence of the system testing has been the accumulation of knowledge related to the safety, installation methodology, design, and development industry standards in PV. Today SWTDI continues to be a leader in education and development of article 690 of the National Electric Code (NEC), Solar Photovoltaic Systems and continues its research in long term panel and inverter testing. However in 2012 SWTDI integrated with the Electrical and Computer Engineering Department of NMSU to broaden the research focus and has developed a microgrid for expanded research into renewable integration into the electric grid and demonstration of ongoing collaborative research with the ECE department on industry partners.

<http://ece.nmsu.edu/research/swtdi>

## Spatial Applications and Research Center (SPARC)

The SpARC laboratory was established in 1982 as an applied contract research laboratory for the NMSU Geography Department. SpARC provides a variety of services including planning and research, GIS, image processing, modeling and training. The original purpose of the laboratory was to undertake externally funded projects under the direction of geography faculty and employ students within the department. Thirty-four years later, the laboratory continues to do project related work. It has employed more than 150 students, and provided assistance to more than 35 faculty members inside and outside Geography. The primary clients of the lab have been federal state and local government agencies, with an emphasis on applied transportation, water resource, and environmental research projects. The lab houses 11 high performance workstations, a range of mapping grade GPS units, and a large scanner/plotter. Software available for use includes database software, ENVI image processing software, TransCAD, and the entire suite of Esri GIS software.

Director: Dr. Christopher Brown ([brownchr@nmsu.edu](mailto:brownchr@nmsu.edu); (575) 646-1892)

## Survey Research and Program Evaluation Center

The Survey Research and Program Evaluation Center (SRPEC) is designed to assist researchers, agency directors, business leaders, and policy makers in all aspects of survey research and program evaluation. Housed in the College of Health and Social Services, the Center has state-of-the-art hardware and software for conducting phone and internet surveys of any type and length as well as facilities for conducting face-to-face interviews and focus groups. SRPEC provides a wide array of services: questionnaire design, sampling, data collection, and statistical analysis for telephone, mail, and internet surveys. Center staff are also able to assist and conduct all forms of program evaluation from formative to summative approaches, including process, outcome and impact evaluations. Bilingual (Spanish/English) questionnaire translation and interviewing are also available.

Director: Dr. Joe Tomaka ([tomaka@nmsu.edu](mailto:tomaka@nmsu.edu); (575) 646-3525)

## University Museum

Established in 1959, the New Mexico State University Museum has provided 50 years of service to the university and community. The University Museum assists NMSU in providing quality education, advancing knowledge through research, and celebrating the culture and history of the southwest and the University. The Museum serves the community as a repository and exhibitor of local and regional history and culture. Through its care and maintenance of donated ethnographic, historic and prehistoric objects, it preserves an important part of Southwestern and Border region culture and history. The Museum encourages faculty and student research using our diverse cultural materials.

The Museum's collections are primarily anthropological (archaeological and ethnographic) with secondary collections in history and the natural sciences. Anthropological collections document the cultural diversity of the border in the Greater Southwest and northern Mexico. The Museum preserves and catalogs collections to promote research and access to cultural materials. Exhibits are developed by students and staff as well as brought in from other institutions.

Director: Dr. Fumi Arakawa ([farakawa@nmsu.edu](mailto:farakawa@nmsu.edu))

Curator: Anna Strankman ([amstrank@nmsu.edu](mailto:amstrank@nmsu.edu))

## Military and Veterans Programs (MVP)

NMSU is a military and veteran friendly university which strives to provide the best possible service to our current and former servicemembers as they pursue their educational goals. NMSU Military and Veterans Programs promotes lifelong learning and professional development for veterans, active-duty military and their families, assisting them in their higher education goals by offering:

- Affordable, in-state tuition rates for active-duty military personnel and dependents using federal education benefits
- Affordable, in-state tuition rates for veterans and dependents receiving U.S. Department of Veterans Affairs education benefits
- Easily transferable credits that count toward degrees at NMSU

- Facilitation of all Department of Defense Tuition Assistance (TA) Benefits
- Courses taught online and at locations near regional military installations
- Innovative technology and course delivery methods
- Internships for veterans
- Student advocacy at every level, from admissions to graduation
- Resource materials from a variety of veteran and military service organizations
- Priority registration for all military and veteran students
- Veterans on Campus Training by Kognito, training faculty and staff on our student veterans and the unique value they bring to campus
- Salute Honor Society for student veterans
- Connection with student organizations
- A tradition of quality education

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

For further information, contact Military and Veterans Programs at:

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

## Costs

### Active-Duty

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

### Dependents Receiving VA Educational Benefits

Per NM 2015 HB 427:

A spouse or child of a veteran of the armed forces is entitled to pay tuition and fees at the rate provided for New Mexico residents; provided that the spouse or child is eligible for benefits pursuant to the federal Post-9/11 Veterans Educational Assistance Act of 2008 or any other federal law authorizing educational benefits for a veteran and the dependents of a veteran. Applications are available by contacting Military and Veterans Programs office.

### Veterans

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

process, eligible persons should contact Military and Veterans Programs office.

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

- Montgomery GI Bill-Active Duty (CH 30)
- Dependents (CH 35)
- Montgomery GI Bill-Selected Reserve (CH 1606 & 1607)
- Vocational Rehabilitation Program (Ch 31)

## MVP Lab

The MVP lab serves as a one-stop shop for military and veteran students with numerous resources on and off campus. Military and Veterans Programs can assist you with all matters at NMSU from admissions to graduation. Military and Veterans Programs has a lab containing 6 PCs. Common Access Card (CAC) readers are available on 2 machines. The lab is open 8am-5pm, Monday through Friday and is available to all military and veteran students including dependents. Enjoy a free cup of coffee while doing your homework or just hang out and network with like-minded veterans. We offer free fax, copy and printing services to further accommodate our students.

## Regulations

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

### Credit for Military Service

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

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

Note: Students submitting military transcripts for credit evaluation must keep in mind the Maximum Time Frame policy, see the Financial Aid Section (p. 28) for more information.

## Tuition Assistance

Tuition Assistance (TA) is a benefit paid to eligible active duty members of the Air Force, Army, Coast Guard, Marines and Navy. The Department of Defense (DoD) has given each service the ability to pay up to \$250 per semester credit hour of the actual cost of tuition (no fees) during the fiscal year (Oct. 1 - Sept. 30). TA will pay for up to 13- semester hours of a bachelor's degree and up to 39 semester hours of a master's degree. TA must be requested and approved prior to the start date of the course.

Service members must first be admitted to NMSU before they may enroll in any classes at NMSU.

Please be aware of our admission and registration process:

1. Servicemembers must apply online to be admitted,
2. login to my.NMSU.edu (<http://my.NMSU.edu>) to register for classes, and
3. create an account and Request TA through their service online portal. Each service has its own criteria for eligibility, application process and restrictions. Refer to our website for service login information: <http://mvp.nmsu.edu/tuition-assistance>

It is important to request TA for the same class and section number as enrolled in NMSU for tuition and grading purposes. Only enrollments requested and approved through their service online portal will be eligible for TA. Refer to our website for further information at <http://mvp.nmsu.edu/tuition-assistance> or contact the Military Programs Coordinator for assistance at [mvp@nmsu.edu](mailto:mvp@nmsu.edu) or (575) 646-4524

## Military/Veteran Graduate Student Status

Veteran benefits are determined by the number of graded graduate credits of enrollment for a given semester or summer session. Listed below are the credit hours that determine student status for military veterans.

Fall and Spring semester: full-time enrollment includes 9 or more graded credit hours. Students are considered three-fourths time if they are enrolled in 7 to 8 credit hours. Half time enrollment is 5 hours. Veterans enrolled in less than 5 credit hours are reimbursed for tuition and allowable fees only.

There are several sessions within the summer term. For the 10 week summer session, full-time enrollment is 6 credit hours and half time enrollment is 3 credit hours. During the five week sessions, full-time enrollment is 4 graded credit hours."

## Military Withdrawal

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

denied, the student may then follow the below steps but must provide documentation that their postponement request was formally denied.

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

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

## Veterans' Attendance and Satisfactory Progress

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

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

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

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

## Resources for Students

### Military and Veteran Housing

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

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

### Service Members Opportunity Consortium (SOC)

The NMSU system has been designated a Servicemembers Opportunity Colleges (SOC) Consortium university. As a member of SOC, NMSU has committed itself to fully support and comply with SOC principles and criteria, ensuring that servicemembers and their families share in the postsecondary educational opportunities available to other citizens. Those eligible are provided with appropriately accredited

educational programs, courses, and services. The flexibility of programs and procedures particularly in admissions, counseling, credit transfer, course articulation, recognition of other applicable learning experiences, including those gained in the military, scheduling, course format and residency requirements are provided to enhance access of servicemembers and their families to undergraduate education programs. All SOC rules and regulations apply, including:

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

For further assistance contact the SOC coordinator through Military and Veterans Programs at:

MSC 4740, NMSU  
P.O. Box 30001  
Las Cruces, NM 88003-8001  
(575) 646-4524

## Responsibility of Veteran Students

Students must be pursuing a degree in a specific program to be eligible for benefits. Admission procedures for veterans and other eligible persons are the same as for all students. Academic advisors must submit degree plans to Military and Veterans Programs prior to certification. For continued certification, students must submit a Concise Student Schedule and STAR Degree Audit to the MVP office every semester.

Veterans must notify the MVP office when any of the following occur:

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

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

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

## Reserve Office Training Corps (ROTC)

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

Curricula in the Departments of Military Science and Aerospace Studies are divided into basic and advanced courses of two years each.

Enrollment in the basic course is voluntary and involves no obligation. Participation in the advanced courses is on a contractual basis and leads to military service as a commissioned officer. Elective academic credit is granted by the university for ROTC classes.

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

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

For more detailed information about the ROTC programs, see the College of Arts and Sciences departments of Aerospace Studies (p. 181) and Military Science (p. 377) in this catalog. Additional information may be obtained by contacting the departments directly at:

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

## UNIV 115 - Transition from Military to University

UNIV 115 Transition from Military to University - Making a positive transition from military to civilian life is a key to success. This course will cover a variety of topics ranging from time management to critical thinking. It is designed to assist military and veteran students in becoming more effective learners through self-awareness, effective study, learning strategies and interpersonal skills. Skills and techniques for managing military to civilian readjustment transition issues are discussed and examined.

# General Education Courses

## The New Mexico Common Core Requirements

General Education at NMSU provides all students with a broad foundation and common framework upon which to develop knowledge and skills, social consciousness and respect for self and others, thus enabling them to function responsibly and effectively now and in the future. General education courses at NMSU can be identified by the G suffix.

The New Mexico General Education Common Core includes designated general education courses guaranteed to transfer to any New Mexico public college or university. A complete list of approved courses can be found on the New Mexico Higher Education Department website at [www.hed.state.nm.us](http://www.hed.state.nm.us) (<http://www.hed.state.nm.us>). The current approved NMSU courses are listed below under each of the five general education areas.

In accordance to state law (Chapter 21, Article 1B NMSA 1978), the New Mexico Higher Education Department has established policies to guarantee successful transfer of completed core courses between New Mexico postsecondary public institutions.

## Lower Division General Education Course Transfer Curriculum

The NMSU Prefix and Course Number will be listed first, the New Mexico Transfer Curriculum number will then be listed in parenthesis' followed by the course title and credit hours.

Code	Title	Credits			
<b>AREA I: Communications</b>			9-10	C S 171G	Introduction to Computer Science 4
Select one course from each sub group:				CHEM 110G	Principles and Applications of Chemistry 4
<i>English Composition-Level 1</i>				CHEM 111G	General Chemistry I 4
ENGL 111G	Rhetoric and Composition	4		CHEM 112G	General Chemistry II 4
ENGL 111GH	Rhetoric and Composition Honors	4		E S 110G	Introductory Environmental Science 4
ENGL 111 M	Rhetoric and Composition for International and Multilingual Students	4		FSTE 164G	Introduction to Food Science and Technology 4
<i>English Composition-Level 2</i>				FSTE 263G	Food Science I 4
ENGL 203G	Business and Professional Communication	3		FWCE 110G	Introduction to Natural Resources Management 4
ENGL 211G	Writing in the Humanities and Social Sciences	3		GEOG 111G	Geography of the Natural Environment 4
ENGL 218G	Technical and Scientific Communication	3		GEOL 111G	Introductory Geology 4
ENGL 311G	Advanced Composition	3		GEOL 212G	The Dynamic Earth 4
ENGL 318G	Advanced Technical and Professional Communication	3		HON 205G	Life, Energy, and Evolution 4
<i>Oral Communication</i>				HON 219G	Earth, Time, and Life 4
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	3		PHYS 110G	The Great Ideas of Physics 4
COMM 253G	Public Speaking	3		PHYS 120G	Introduction to Acoustics 4
COMM 265G	Principles of Human Communication	3		PHYS 211G & 211GL	General Physics I and General Physics I Laboratory 4
HON 265G	Principles of Human Communication Honors	3		PHYS 212G & 212GL	General Physics II and General Physics II Laboratory 4
<b>Area II: Mathematics/Algebra</b>			3-4	PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory 4
A ST/STAT 251G	Statistics for Business and the Behavioral Sciences			PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory 4
MATH 112G	Fundamentals of Elementary Math II	3		PHYS 221G & 221GL	General Physics for Life Sciences I and Laboratory to General Physics for Life Science I 4
MATH 121G	College Algebra	3		PHYS 222G & 222GL	General Physics for Life Sciences II and Laboratory to General Physics for Life Sciences II 4
MATH 142G	Calculus for the Biological and Management Sciences	3		<b>Area IV/V- Social/Behavioral Sciences and Humanities/Fine Arts</b> 15	
MATH 190G	Trigonometry and Precalculus	4		<i>Area IV: Social/Behavioral Sciences<sup>1</sup></i>	
MATH 191G	Calculus and Analytic Geometry I	4		AG E/FSTE 210G	Survey of Food and Agricultural Issues
MATH 192G	Calculus and Analytic Geometry II	4		ANTH 120G	Human Ancestors 3
MATH 192GH	Calculus and Analytic Geometry II Honors	4		ANTH 125G	Introduction to World Cultures 3
MATH 210G	Mathematics Appreciation	3		ANTH 201G	Introduction to Anthropology 3
MATH 291G	Calculus and Analytic Geometry III	3		ANTH 202G	World Archaeology 3
STAT 271G	Statistics for Psychological Sciences	3		ANTH 203G	Introduction to Language and Cultural Anthropology 3
<b>Area III: Laboratory Sciences</b>			8	C EP 110G	Human Growth and Behavior 3
AGRO/HORT 100G	Introductory Plant Science			C J 101G	Introduction to Criminal Justice 3
ANTH 130G & 130GL	Human's Place in Nature: Introduction to Biological Anthropology and Human's Place in Nature Laboratory	4		ECON 201G	Introduction to Economics 3
ASTR 105G	The Planets	4		ECON 251G	Principles of Macroeconomics 3
ASTR 110G	Introduction to Astronomy	4		ECON 252G	Principles of Microeconomics 3
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	4		GEOG 112G	World Regional Geography 3
BIOL 110G	Contemporary Problems in Biology	4		GEOG 120G	Culture and Environment 3
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	4		GOVT 100G	American National Government 3
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	4		GOVT 110G	Introduction to Political Science 3
				GOVT 150G	American Political Issues 3
				GOVT 160G	International Political Issues 3
				HON 232G	The Human Mind 3
				HON 235G	Window on Humanity 3

HON 237G	Archaeology: Search for the Past	3
HON 248G	The Citizen and the State: Great Political Issues	3
HON 249G	American Politics in a Changing World	3
JOUR 105G	Media and Society	3
LING 200G	Introduction to Language	3
PHLS 150G	Personal Health and Wellness	3
PSY 201G	Introduction to Psychology	3
S WK 221G	Introduction to Social Welfare	3
SOC 101G	Introductory Sociology	3
SOC 201G	Contemporary Social Problems	3
W S 201G	Introduction to Women s Studies	3
W S 202G	Representing Women Across Cultures	3
<i>Area V: Humanities and Fine Arts</i> <sup>1</sup>		
ART 101G	Orientation in Art	3
ART 110G	Visual Concepts	3
ART 295G	Introduction to Art History I	3
ART 296G	Introduction to Art History II	3
DANC 101G	Dance Appreciation	3
ENGL 115G	Perspectives on Literature	3
ENGL 116G	Perspectives on Film	3
ENGL 220G	Introduction to Creative Writing	3
ENGL 244G	Literature and Culture	3
HIST 101G	Roots of Modern Europe	3
HIST 102G	Modern Europe	3
HIST 110G	Making History	3
HIST 111G	Global History to 1500	3
HIST 112G	Global History Since 1500	3
HIST 201G	Introduction to Early American History	3
HIST 202G	Introduction to Recent American History	3
HIST 211G	East Asia to 1600	3
HIST 212G	East Asia since 1600	3
HIST 221G	Islamic Civilizations to 1800	3
HIST 222G	Islamic Civilizations since 1800	3
HON 208G	Music in Time and Space	3
HON 216G	Encounters with Art	3
HON 220G	The World of the Renaissance: Discovering the Modern	3
HON 222G	Foundations of Western Culture	3
HON 227G	Plato and the Discovery of Philosophy	3
HON 228G	Religion and the State	3
HON 229G	The New Testament as Literature	3
HON 230G	Bamboo and Silk: The Fabric of Chinese Literature	3
HON 234G	The Worlds of Arthur	3
HON 239G	Medieval Understandings: Literature and Culture in the Middle Ages	3
HON 242G	Claiming an American Past	3
HON 270G	Theatre: Beginnings to Broadway	3
MUS 101G	An Introduction to Music	3
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	3
PHIL 100G	Philosophy, Law and Ethics	3

PHIL 101G	The Art of Wondering	3
PHIL 124G	Philosophy of Music	3
PHIL 136G	The Quest for God	3
PHIL 201G	Introduction to Philosophy	3
PHIL 211G	Informal Logic	3
PHIL 223G	Ethics	3
THTR 101G	The World of Theatre	3
Total Credits		35-37

<sup>1</sup> For Areas IV and V of the NM Common Core, students can take 6-9 credits of each area for a total of 15 credits.

## Alternatives for Meeting General Education Requirements

Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area. For example, a student may complete ART 150 Drawing I, ART 155 2-D Fundamentals and ART 156 3-D Fundamentals (9 hours) and thereby satisfy one course from the Area V: Humanities and Fine Arts category, even though none of those courses carries a G suffix. Please check with the Center for Academic Advising and Student Support.

## NMSU Viewing a Wider World Requirements

The Viewing a Wider World (VWW) requirement fosters intelligent inquiry, abstract logical thinking, critical analysis, as well as the integration and synthesis of knowledge. The program strives for literacy in writing, reading, speaking and listening. It teaches mathematical structures, acquainting students with precise abstract thought about numbers and space. The program also encourages an understanding of science and scientific inquiry, as it provides a historical consciousness, including an understanding of one's own heritage as well as respect for other peoples and cultures. To achieve its goals, the program includes an examination of values and stresses the importance of a carefully considered values system as it fosters an appreciation of the arts and general education. It provides the breadth necessary to have a familiarity with the various branches of human understanding. All VWW courses can be identified by the "V" suffix.

Prior to graduating, NMSU students are required to take two courses from separate colleges from the Viewing a Wider World list in the Catalog. These courses are upper-division (300-400 level) Viewing a Wider World courses and should be taken in a student's junior and/or senior year. One of the two courses must be in a college other than their own. The other course may be taken within their home college, but this course:

1. must be in a different department from their major department;
2. must not be cross-listed with a course in their home department;
3. cannot be counted as one of the requirements for the student's major.

These courses strongly emphasize the international character and multicultural influences in the fields of study and strengthen information retrieval skills. There are two options that NMSU allows for replacing 3 credits of VWW requirement with another form of educational experience, these are:

1. **Study Abroad Experience**- consisting of at least four weeks of a Study Abroad program or university coursework in a foreign country earning 3 credits.
2. **Military Experience**- for students who have served at least four weeks of military service in a foreign country.

The Military and Veterans Programs Office website (<http://mvp.nmsu.edu/new-students/military-experience-waiver>) provides the instructions on how to request the waiver for Military Experience replacing 3 credits of VWW.

*NOTE: This list is under continuous revision. Please check with the office of the college associate dean or with college advisors for additional eligible courses. Honors courses have a specific college designation based on course content. These are listed near the end of this section.*

## College of Agricultural, Consumer and Environmental Sciences

AG E 315V	World Agriculture and Food Problems	3
AG E 337V	Natural Resource Economics	3
AG E 384V	Water Resource Economics	3
AG E 445V	Agricultural Policy	3
AGRO 303V	Genetics and Society	3
ANSC 312V	Companion Animals and the Human-Animal Interaction	3
ANSC 351V	Agricultural Animals of the World	3
AXED 466V	John Muir: Lessons in Sustainability	3
CAST 301V	Introduction to Child Advocacy	3
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 380V	Science & Society	3
FCS 449V	Family Ethnicities and Subcultures	3
GENE 303V	Genetics and Society	3
HORT 302V	Forestry and Society	3
RGSC 302V	Forestry and Society	3

## College of Arts and Sciences

ANTH 305V	Contemporary Native Americans	3
ANTH 306V	Peoples of Latin America	3
ANTH 330V	Magic, Witchcraft and Religion	3
ANTH 357V	Medical Anthropology	3
ANTH 360V	Food and Culture Around the World	3
ASTR 301V	Revolutionary Ideas in Astronomy	3
ASTR 305V	The Search for Life in the Universe	3
ASTR 308V	Into the Final Frontier	3
ASTR 330V	Planetary Exploration	3
C J 440V	Comparative Criminal Justice Systems	3
ENGL 321V	Modern European Drama	3
ENGL 327V	Shakespeare around the Globe	3
ENGL 328V	Literature of Science Fiction and Fantasy	3
ENGL 330V	Studies in Poetry	3
ENGL 335V	Studies in the Novel	3
ENGL 339V	Chicana/o Literature	3
ENGL 341V	American Indian Literature	3
ENGL 380V	Women Writers	3
ENGL 392V	Mythology	3

ENGL 394V	Southwestern Literature	3
GEOG 315V	World Agriculture and Food Problems	3
GEOG 325V	New Mexico and the American West	3
GEOG 328V	Geography of Latin America	3
GEOG 331V	Europe	3
GEOG 361V	Economic Geography	3
GEOG 363V	Cultural Geography	3
GEOG 365V	Urban Geography	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GER 333V	German Culture through Cinema	3
GOVT 380V	Contemporary World Political Ideologies	3
GPHY 340V	Planet Earth	3
HIST 302V	Science in Modern Society	3
HIST 311V	Colonial Latin America	3
HIST 312V	Modern Latin America	3
HIST 330V	Introduction to Religious Studies	3
HIST 366V	British Imperialism	3
HIST 374V	The European City: History and Culture	3
HIST 382V	Modern Russia	3
HIST 390V	The Holocaust	3
HIST 425V	History of Magic and Witchcraft in Medieval and Renaissance Europe	3
JOUR 377V	Mass Media Ethics	3
LING 302V	Language and Society	3
MATH 411V	Great Theorems: The Art of Mathematics	3
PHIL 323V	Engineering Ethics	3
PHYS 303V	Energy and Society in the New Millennium	3
PHYS 305V	The Search for Water in the Solar System	3
PSY 417V	Intercultural Relations	3
SOC 330V	Introduction to Religious Studies	3
SOC 336V	Sociology of Pop Culture	3
SOC 360V	Introduction to Population Studies	3
SOC 361V	Social Issues in the Rural Americas	3
SOC 374V	Comparative Family Systems	3
SOC 376V	Social Change	3
SOC 394V	Sports and Society: A Global Perspective	3
SOC 458V	Comparative Global Family Systems	3
SOC 465V	Environmental Sociology	3
SPAN 364V	Culture and Civilization of Mexico	3
SPAN 365V	Culture and Civilization of Spanish America	3
THTR 307V	Society in Style: Fashion, History and Culture	3
THTR 321V	Modern European Drama	3
W S 380V	Women Writers	3
W S 381V	Women s Health Issues	3

## College of Business

BLAW 385V	Consumers and the Law	3
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BLAW 430V	American Indian Law and Policy	3
ECON 324V	Developing Nations	3
ECON 325V	Economic Development of Latin America	3
ECON 335V	Business and Government	3
ECON 337V	Natural Resource Economics	3
ECON 384V	Water Resource Economics	3
ECON 432V	Economics of Health Care	3
FIN 303V	Personal Financial Planning and Investing in a Global Economy	3
MGT 315V	Human Relations in Organizations	3
MGT 335V	Business and Government	3
MGT 345V	Quality and Competitiveness: An International Perspective	3
MGT 360V	Negotiation and Business Conflict Resolution: Theory and Practice	3
MGT 375V	Global Environmental Assessment and Management	3
MGT 388V	Leadership and Society	3
MKTG 311V	Consumer Behavior	3

### College of Education

C EP 300V	Human Relations Training	3
C EP 451V	Introduction to Counseling	3
DANC 451V	World Dance	3
EDUC 317V	Multicultural Issues in Society	3
ELA 350V	Introduction to Educational Leadership in a Global Society	3

### College of Engineering

C E 355V	Technology and the Global Environment	3
CHME 395V	Brewing Science and Society	3
E T 309V	Manufacturing: History and Technology	3
E T 360V	Technology in Business and Society	3

### College of Health and Social Services

PHLS 301V	Human Sexuality	3
PHLS 305V	Global Environmental Health Issues	3
PHLS 380V	Women's Health Issues	3
PHLS 464V	Cross-Cultural Aspects of Health	3
S WK 331V	Introduction to Social Policy: History	3

### University Library

LIB 311V	Information Literacy	3
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## Honors - Viewing a Wider World

### College of Agricultural, Consumer and Environmental Sciences

HON 321V	Agriculture in an Interconnected World	3
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### College of Arts and Sciences

HON 304V	Dilemmas of War and Peace	3
HON 305V	Global Environment	3
HON 306V	Science, Ethics and Society	3
HON 308V	Into the Final Frontier	3

HON 318V	The World of Cinema	3
HON 324V	Science and the Arts: Theatre and Story	3
HON 326V	Art and Mythology	3
HON 328V	Rock History: 20th Century Popular Music	3
HON 341V	The Old Testament as Literature	3
HON 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	3
HON 349V	Islam and the West: Cultural Contacts, Conflicts, and Exchanges	3
HON 351V	Interpersonal Relations and the Self	3
HON 353V	Justice without Prejudice	3
HON 362V	Native American Philosophy and Spirituality	3
HON 365V	African and Caribbean: Literature and Film	3
HON 366V	The Gothic Imagination	3
HON 370V	Design: The Creative Act	3
HON 371V	Paris: Beyond the Eiffel Tower	3
HON 374V	The European City: History and Culture	3
HON 375V	The U.S. City: A History of Race, Space, and Urbanization	3
HON 377V	Freedom of Speech and the Law	3
HON 379V	Literature as Film	3
HON 387V	Comparative Perspectives on Women	3
HON 390V	Worlds of Buddhism	3
HON 394V	Southwestern and Border Literature	3
HON 411V	Great Theorems: The Art of Mathematics	3
HON 425V	Magic and Witchcraft in Medieval and Renaissance	3
HON 450V	The Sundt Honors Seminar	3

### College of Business

HON 335V	Legal Issues in Modern Society	3
HON 340V	Indian Law and Policy	3
HON 380V	Comparative Economic Systems	3
HON 381V	Economic Development of Latin America	3
HON 384V	Ethical Decisions in Organizations	3
HON 385V	Consumers and the Law	3

### College of Education

HON 347V	World Dance	3
HON 388V	Leadership and Society	3

### Alternatives for Meeting Viewing a Wider World Requirements

Students taking nine or more credits in a specific subject area, even though the courses are not designated as Viewing a Wider World courses, will have met the VWW requirements for that subject area.

The 9 credit hours must be in 300- to 400-level courses in one prefix area. For example, 9 upper-division ECON credits would fulfill one VWW area for students majoring in programs other than Economics.

## Graduation Requirements

For specific information about graduation requirements for specific degrees, as well as, information about the commencement ceremony and the application for degree processes please see “The NMSU System Academic Regulations section (p. 71)” for Graduation Requirements.

## Recognition of Academic Achievement

NMSU has a number of university-wide programs that recognize academic achievement. These include

- the Honors College,
- the Crimson Scholars Program,
- the dean’s report of academic achievement and
- graduation with honors.

In addition, many colleges and departments have their own programs and awards that recognize the academic achievement of their students.

## The Honors College

The Honors College provides motivated undergraduate students with opportunities to broaden and enrich their academic programs. In small classes taught by master teachers, honors students engage in lively discussion and collaborative investigation of interdisciplinary topics. By taking honors courses, students may also work toward completing general education requirements and disciplinary requirements in the major. There are two program options available to students: University Honors and the Honors Certificate. Each option has separate eligibility requirements, benefits, and forms of recognition for the student. For details concerning eligibility and requirements, see the Honors College (p. 672) section of the catalog.

### Crimson Scholars Program

Crimson Scholars is a recognition program for academically superior students who achieve and maintain a Grade Point Average (GPA) of 3.5 or better. Crimson Scholars receive a number of benefits, including:

- Automatic eligibility for all Honors courses
- Early registration
- Recognition in the commencement program
- Regalia for Commencement that acknowledges the Crimson Scholar designation
- Permission to live in the Honors Residential Community

For eligibility criteria, see the Honors College (p. 672) section of the catalog.

### Dean’s Report of Academic Achievement

Following the close of the semester, each college dean publishes a list of students who have achieved honor standing in grades for the previous semester. To be eligible, a student must have been enrolled in 12 or more semester credits with a computable grade in each. The top 15 percent of eligible students by college for that semester will be named to the Dean’s Honor List.

### Graduation with Honors

To be eligible for a four-year degree with honors, a student must have earned at least 60 semester credits in computable grades while in

residence at New Mexico State. Courses taken in the Honors College and graded S will be counted as a part of the minimum of 60 credits. The number of students at graduation, by college, receiving degrees with honors in any one year shall not exceed 15 percent. To receive high honors, a student must be in the top 1.5 percent of the graduating class by college. One person from each college will receive highest honors. In case of a tie, the student with the greatest numbers of credits earned at NMSU with computable grades will be awarded highest honors for each college. Of the students receiving highest honors from the fall and spring commencements, the student with the highest grade-point average and the greatest number of credits earned at NMSU with computable grades will be awarded the Class of 1919 Scholarship Plaque.

## Preprofessional Programs

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. The programs are:

**Preveterinary Medicine** is administered by the College of Agricultural, Consumer and Environmental Sciences

**Prehealth** is administered by the Center for Academic Advising and Student Support.

**Pre-Nursing, Pre-Social Work, Pre- Public Health Sciences** majors are administered by the College of Health and Social Services. Students new to NMSU, or who are working toward completion of their respective departmental pre-requisites are able to declare their major in the College of Health and Social Services. Once pre-requisites have been satisfied, an application process is required specific to each major. Application details and requirements are available through the “AcademicDepartments” link on the College of Health and Social Services website (<http://health.nmsu.edu>), and also through the Central Advising Center.

**Prelaw** is administered by the College of Business and by the College of Arts and Sciences. Law schools will accept undergraduates who have earned bachelor’s degrees in any major. Many prelaw students take some law courses in their undergraduate program. The College of Arts and Sciences supervises a Supplementary Major in Law and Society, which includes courses from a number of departments and several colleges. It is described under “Government” in the Arts and Sciences chapter. The College of Business offers a number of Business Law courses which can be found under the prefix BLAW in the course description chapter later in this catalog.

Further information will be found in the sections of this catalog devoted to the colleges. (See also the paragraph on Western Interstate Commission for Higher Education)

## Academic Programs

### Associate Degree Programs

NMSU awards both designated and undesignated associate degrees following completion of at least 60 semester credits (excluding “N” suffix courses). The last 15 to 30 credits, depending on the requirements of the college in which the degree is pursued, must be completed at NMSU or one of its Community Colleges. (Service personnel enrolled under the two-year Servicemembers Opportunity College Program may be exempt from this requirement.)

The designation Meritorious Graduate is awarded to the top 15 percent of the students receiving associate degrees within each college in any

one academic year; the students must have completed 45 or more credits with computable grades at NMSU.

## Las Cruces Campus

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

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

## Designated Associate Degrees

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

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

## Community Colleges

Many of the associate degrees offered on Las Cruces campus, as well as other programs, are available at NMSU's four community college campuses. For more information on community college campus offerings, refer to the "Community Colleges (p. 676)" chapter in this catalog and to their respective catalogs or admissions offices.

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

- Alamogordo Catalog
- Dona Ana Catalog
- Carlsbad Catalog
- Grants Catalog

## Undergraduate Programs

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

## Graduate Degree Programs

For a full listing of the Graduate Programs offered at New Mexico State University, please see the Graduate Admissions webpage <http://gradadmissions.nmsu.edu/graduate-programs/>.

## Academic Minors

Students seeking a degree may elect to complete one or more minors from those available, and the minor will be designated on their transcripts. Minors cannot be earned after the degree has been conferred.

A minor consists of a minimum of 18 credits, at least 9 of which must be upper-division. The minor may be in a single department or may be interdepartmental. Specific requirements for these minors are available in printed form in departmental and deans' offices. Specific the College sections for a complete list of the minors offered in that college.

# NMSU SYSTEM ACADEMIC REGULATIONS & POLICIES

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

The regulations section is broken down into different areas:

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

## Academic Programs of Study

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

## Additional Degree Designations

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

## Catalog Effective Period

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

effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

## Application for Degree/Graduation or Certificate

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

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

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

## Multiple Degrees and Designations

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

## Degree Revocation

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

## Honorary Degrees

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

## Community College Certificate

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

## Certificate of Achievement

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

## Certificate of Completion

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

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

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

## Associate's Degree

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

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

1. **Minimum Credit Hours:** a minimum of 60 credits (excluding "N" suffix courses). Some programs of study require coursework in excess of the 60 credit-hour minimum.
2. **GPA requirement:** Students must have a cumulative GPA of 2.0 or better in all courses taken at NMSU or one of its community colleges. In addition, students must earn a C- or better in classes they take to meet the Basic Skills requirement (English 111g and one of several math course options),
3. **Residency** - 15 of the last 30 credits earned toward the degree must be completed at NMSU.
4. **Major:** All requirements for at least one major field of study as specified in the college and departmental sections of the respective catalog.

### Associate Major

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

## Baccalaureate Degree (Bachelor's Degree)

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

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

## Bachelor's Degree Designations

### Undergraduate Major

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

### Supplemental Major

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

### Undergraduate Minor

An undergraduate minor consist of 18 credits of course work, of which 9 credits must be upper-division (300-499). A minor encompasses courses that in a recognized field of study outside the student's major. At least 12 credits of a minor must be completed at NMSU. Additional requirements for minors are specified in the college and department's designated sections of this catalog.

### Undergraduate Concentration

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

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

## Distance Education Bachelor's Degree Completion Program

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

## Graduating with Honors

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

## Graduate Degrees

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

### Graduate Degree Designations

#### Graduate Major

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

#### Graduate Minor

A graduate minor is based on at least 9 graduate credits in courses that encompass a recognized field of study outside the student's major. Departments may require certain courses be a part of a minor and may exclude other courses.

#### Graduate Concentrations

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

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

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

### Graduate Certificates

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

## Master's Degree

New Mexico State University offers both academic and professional master's degrees. A link to the list of all master's degrees is provided in the Graduate School section of this catalog.

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

### Admissions to the Master's Degree

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

### Program of Study

During the first semester of enrollment each new graduate student should prepare a complete program of study in consultation with the student's advisor.

### Application to Candidacy

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

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

The student's program of study must:

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

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

### Credit Hour Requirement

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

At least 15 credits for the master's degree must be for work in courses within the student's department. Additional credits may be selected from other fields to fit into a logical and justifiable program. However, courses

that are used to remove deficiencies or satisfy prerequisites cannot be counted as requirements for a master's degree.

### Coursework Requirement

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

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

### Thesis Option

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

- *Continuous Enrollment*- once registered, a student must continue to register for a minimum of 1 credit in thesis or graduate coursework each regular semester until the thesis is approved by the Graduate School and the copies have been accepted by the Branson Library binding section. .

### Graduate Committee for Thesis Option

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

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

### Finalizing the Master's Thesis

After successful completion of the final examination, a copy of the thesis must be submitted to the Graduate School for format review no later than the deadline posted to the Graduate School website. The form and style of the thesis must comply with the regulations given in the Guidelines for Preparing a Thesis or Dissertation <http://gradschool.nmsu.edu/theses-dissertations/>. These guidelines also contain detailed information on the thesis approval process and binding. The thesis is not complete until copies have been accepted for binding by the binding section staff and until the online Library binding form has been completed and received in Branson Library

### Professional Degree and Non-Thesis Final Examination

Each candidate will be given a final examination conducted by their graduate committee in accordance to the schedule provided by the Graduate School. It is the department's responsibility to ensure that the Report of Results for the Master's Professional or Non-Thesis Final Exam

form is submitted to the Graduate School at least ten working days after the exam.

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

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

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

Any candidate who fails in the final examination may either:

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

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

### Time Limit

Students must complete the master's degree program within seven years (or eight successive summers) of the start of the degree, including completion of the master's thesis or final project. Any coursework more than seven years old at the time of the final examination will not be included in the program. Any exception to the time limit rule must have prior approval of the Dean of the Graduate School.

### Master's Accelerated Program (MAP)

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

Undergraduate students may apply for acceptance to a Master's Accelerated Program available at New Mexico State University after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at New Mexico State University and apply towards the undergraduate major. The grade point average must be a minimum of 3.0; departments participating in the master's accelerated program may have requirements that exceed these minimum requirements. **It is the student's responsibility to meet with their financial aid advisor. Awards may be adjusted to reflect enrollment in an undergraduate/graduate program.**

Graduate departments within the colleges may allow academically qualified undergraduate students to substitute a maximum of 12 graduate course credits for elective courses in an undergraduate degree program. Graduate programs have the discretion to use up to 12 credits of NMSU coursework (450 level or higher) that can logically be applied

towards the completion of master's program of study. A grade of B or higher in this coursework will be required .

### Program Participation Requirements:

1. Students must obtain prior approval by the graduate program
2. Student's course work must be general or discipline electives in the student's undergraduate course of study. No required courses from the undergraduate program will be accepted towards the Master's Accelerated Program.
3. Students will enroll in approved graduate level courses. If course(s) requires instructor approval, it is the students responsibility to obtain necessary approval
4. Students participating in MAP are required to submit a completed Master's Accelerated Program Referral Form to the Graduate School by the first Friday of classes, with all required signatures.
5. Students participate in the Developing New Scholars Program (DNSP) through the Graduate School. The DNSP program provides formal mentoring supporting application process to Graduate School. Upon awarding of the Bachelor's degree and formal admissions into a master's/graduate program at NMSU, the approved credits (up to 12) will be recorded on both the undergraduate and the graduate transcript.

### Interdisciplinary Master's Degree

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

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

### Admission

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

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

### Degree(s) Awarded

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

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

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

### Thesis/Non-thesis Option

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

must reflect the interdisciplinary nature of the program which the student is pursuing.

### **Comprehensive Exam**

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

### **Second Master's Degree**

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

### **Teacher Licensure**

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

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

### **Specialist in Education**

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

### **Residency and Credit Requirements**

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

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

### **Program of Study**

It is recommended that during the first semester of enrollment each beginning graduate student should prepare a complete program of study with the student's advisor. The program of study can be tentative, should be kept in the student's file within the department, and is not considered an "Application for Admission to Candidacy."

### **Major Field**

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

### **Candidacy**

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

### **Internship**

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

### **Oral Examination**

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

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

### **Time Limit**

The specialist in education degree must be completed within seven years following admission to the program. Students cannot include any course work on their program of study that is more than seven years old at the time of the final oral examination.

### **Doctoral Degrees**

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

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

### **Professional Doctoral Degrees**

#### **Doctor of Economic Development (DED)**

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

A project paper must be finalized using a similar submission process as the dissertation (see the "Finalizing the Doctoral Dissertation"). On the front page, after the title of the paper, the student should indicate that it is a project paper. Students completing projects papers do not need to complete the earned doctoral survey. The paper must be submitted

to the Graduate School for format review on or before the deadline. The form and style of the paper must comply with regulations given in the "Guidelines for Preparing a Thesis or Dissertation." These guidelines also contain detailed information on the dissertation/project paper- approval process as well as information on binding. Candidates are encouraged to consult with the Graduate School on format, deadlines and procedures before final typing. The project paper is not complete until copies have been accepted for binding by the staff of Branson Library and until the microfilm agreement form has been completed and received in Branson Library.

### **Doctor of Education (Ed.D)**

The degree of Doctor of Education demonstrates proficiency in a program of graduate study in which the emphasis is in preparation for performance in professional education. This program is intended primarily for students pursuing careers in which teaching, administration or school services are predominate rather than those in research. The Ed.D. Degree in curriculum and instruction is offered in the Department of Curriculum and Instruction; the degree in educational administration is offered in the Department of Educational Leadership and Administration.

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

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

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

### **Doctor of Nursing Practice (DNP)**

Students holding a Bachelor's degree in Nursing are required to complete and pass all required course work for the DNP program, as well as, complete and pass their comprehensive examination. Since a dissertation is not required, they are expected to complete an internship experience and a project paper as defined by their program. They can embark on the project paper once they have completed and passed their comprehensive examination. They are not required to take 700 level dissertation hours. However, they are expected to complete at least 12 credits at the 600 level including NURS 698 (Advanced Clinical Immersion) credits sufficient to complete the DNP Final Project.

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

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

Post- MSN DNP students must complete at least 6 credits at the 600 level, including NURS 698 credits sufficient to finish the DNP Project. Finalized projects must be uploaded to a national DNP Project repository approved by the Graduate Faculty of the School of Nursing in order to achieve the DNP degree.

### **Doctor of Philosophy (Ph.D.)**

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

### **Interdisciplinary Doctorate**

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

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

1. Students wishing to study in the interdisciplinary doctoral degree program must apply and be accepted into a doctorate-granting department.
2. A master's degree or equivalent program of study that includes at least 30 credits of graduate course work with a minimum cumulative GPA of 3.0.
3. Twelve credits of graduate course work must be completed at NMSU in order to apply for admission into the interdisciplinary doctorate degree program. Additional course work is required for degree completion.
4. Evidence of outstanding academic achievement in graduate school.
5. A written description of the program concept prepared by the student consisting of:
  - a. Areas in which competency is required
  - b. Purposed readings and course work and how these relate to required competencies
  - c. Objectives and an outline for thesis research
  - d. Justification for not using an existing departmental degree program
6. Student must select an advisor from his/her department to help structure and chair a committee consisting of at least five faculty members from the graduate faculty list who are willing to work on the interdisciplinary degree program. The committee must include at least two members from each of the two doctorate-granting

departments. The committee chair will convene a meeting to review and approve the proposed program.

7. The Graduate School will send an Admission Referral document, signed by all the committee members, to the heads of all the departments from which the student proposes to use more than 8 credits of course work, or from the department which the faculty are requested to serve on the proposed committee.
8. Once the Admission Referral document has been approved by all departments, the committee chair will convene a meeting of the committee to review the student's program and make changes as necessary. In addition, the committee will set the format and date for the qualifying exam. An effort should be made to incorporate the interdisciplinary nature of the program into the qualifying exam.
9. Students have satisfied the requirements for admission to the program once the qualifying exam has been passed and the respective department heads approve the Admission Referral memorandum. Formal acceptance into a doctoral program may be required in order to receive financial assistance.
10. The number of courses required for degree completion will vary depending on the student's program of study, please see the department for more specific requirements. However, Interdisciplinary doctorate degree students must meet the requirements for residency, registration, the comprehensive examination, the Final Examination, the dissertation and the declaration of approved minor.
11. The dissertation work shall include at least 18 credits of a 700-level course.

### Completing your Doctoral Degree Program

Any student who fails to abide by the regulations in this section will be considered withdrawn from the university. In order to resume their studies, the student must formally apply for readmission to the Graduate School and satisfy any requirements that are in effect at the time of reapplication.

### Declaration of Approved Minor

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

### Qualifying Examination

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

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

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

may allow the master's final examination to serve as the doctoral qualifying examination or may require a separate examination.

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

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

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

Students will be admitted to the doctoral program once the qualifying examination is passed. The student's advisor and department head will then appoint the doctoral committee to prepare the student's preliminary doctorate program of study. The student must submit the program of study to the Graduate School immediately following admission into the doctoral program and before registering for additional coursework.

### Doctoral Graduate Committee

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

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

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

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

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

### Program of Study

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

- Completed 12 graduate credits while at NMSU that are beyond the master's degree

- Successfully completed the qualifying examination

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

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

### **Comprehensive Examination**

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

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

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

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

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

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

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

### **Time Limit for the Comprehensive Examination**

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

### **Advancement to Candidacy**

Advancement to Candidacy recognizes that the student has demonstrated the ability to sustain a level of scholarly competency commensurate with successful completion of degree requirements. Upon advancement to candidacy, the student is cleared for the final stages of

the graduate program which may include a dissertation, project or written examination.

For advancement to candidacy the following criteria must be met

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

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

### **Residency Requirements**

The minimum campus residency requirements for the doctoral degree include enrollment in a minimum of 9 credit hours of program course work, including a minimum of 3 credit hours of dissertation, in at least two semesters of classes taught at NMSU. In some cases the minimum credit hour enrollment for the two semesters required to establish residency may vary based on the instructional delivery of the program, and must have prior approval from the Dean of the Graduate School.

### **Dissertation Registration during Fall/Spring Sessions**

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

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

### **Dissertation Registration during Summer Sessions**

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

### **Dissertation Leave of Absence**

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

### **Final Examination**

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

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

When a complete draft of the dissertation has been prepared, the student's doctoral committee (appointed after the qualifying

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

The final examination must be completed in accordance with the schedule provided in the academic calendar. Ten working days before the examination is taken the department must submit the form requesting this examination to the Graduate School. This form may be found on the Web at <http://gradschool.nmsu.edu/graduate-forms/> and is also available from the Graduate School and departmental offices.

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

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

### Finalizing the Doctoral Dissertation

After successful completion of the final examination, a copy of the dissertation must be submitted to the Graduate School for format review no later than the deadline posted to the Graduate School website.

The form and style of the dissertation must comply with the regulations given in the Guidelines for Preparing a Thesis or Dissertation <http://gradschool.nmsu.edu/theses-dissertations/>. These guidelines also contain detailed information on the dissertation-approval process and binding. Candidates are encouraged to consult with the Graduate School on format, deadlines and procedures before final typing.

The dissertation is not complete until copies have been accepted for binding by the binding section staff and until the UMI agreement form and the online Library binding form has been completed and received in Branson Library.

## Registration

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

## Admission Requirement

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

## Course Schedule

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

## Registration Schedule by Classification

Several groups of students (e.g. Crimson Scholars, Students with Disabilities, Veterans) receive priority dates for course registration. For other students, registration dates are determined by the student's current classification at the time of registration. A student's classification is determined by the number of credits completed, and does not include courses in progress. Freshmen have less than 29 completed credits. Sophomore rank is achieved with successful completion of 28 credits; junior rank 60 credits; senior rank 90 credits.

## University Credits

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

## Course Load for Undergraduate Students

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

An overload is classified as more than 18 credits for a regular semester and more than 12 credits for the summer term. A one-credit course in physical education or supplemental instruction will not create an overload. Registration for a course overload requires written permission from the Director of the Center for Academic Advising and Student Support or the Associate Dean for Academics in the student's college. A "Change of Schedule ([https://registrar.nmsu.edu/files/2018/03/Change-of-Schedule\\_Updated-02-02-18-1.pdf](https://registrar.nmsu.edu/files/2018/03/Change-of-Schedule_Updated-02-02-18-1.pdf))" form is required and available from the University Student Records Office or on their website (<https://records.nmsu.edu>). Freshmen and students with a grade of D or F, or a cumulative grade-point average of less than 2.5, in either of the last two semesters, are not eligible for overloads. Concurrent enrollment in non-NMSU courses at other post-secondary institutions requires prior approval from the Associate Dean for Academics in the student's college, and these courses are counted as part of a student's class load.

## Course Load for Graduate Students

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

## Course Numbering

The course numbering system at NMSU indicates the level of the course as follows:

Undergraduate courses are assigned numbers 100-499. Courses numbered 100-299 are referred to as "lower-division courses" and are primarily for Freshman and Sophomore level students. Courses numbered

300-499 are referred to as “upper-division courses” and are primarily for Junior and Senior level students.

Graduate courses are assigned numbers 500 or greater. Courses numbered 500-599 are primarily for graduate students working on a master’s degree. Courses numbered 600-700 are primarily for students working on a doctoral degree.

Some graduate programs may accept courses numbered 450-499 for graduate credit. Graduate students should confirm eligibility with their program department head.

## Prerequisites and Corequisites

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

## Registration Changes

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

The University Student Records Office publishes an online schedule of “Important Dates for Students” for each semester. The student is responsible for reviewing and adhering to the Important Dates, including the deadlines to add, drop or withdraw from course(s) for the relevant semester.

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

1. **Last day to add a class without instructor’s signature** - during this period courses may be added online through myNMSU, or through your academic advisor (if necessary).
2. **Last day to add a class with instructor’s signature** - during this period courses may only be added with “Change of Schedule ([https://registrar.nmsu.edu/files/2018/03/Change-of-Schedule\\_Updated-02-02-18-1.pdf](https://registrar.nmsu.edu/files/2018/03/Change-of-Schedule_Updated-02-02-18-1.pdf))” form signed by the instructor (available online on the University Student Records Office website (<https://records.nmsu.edu>)).  
\* Students taking classes online and who do not live in the Las Cruces Area must email the instructor, using the NMSU email, in order to get permission to be added to the course. If the instructor approves the addition, the approved response must be sent to either the student’s academic advisor or to records ()@nmsu.edu (registrar@nmsu.edu) with the student’s name, ID number and course CRN number they are wanting to add.

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

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

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

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

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

## Waitlisting

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

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

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

Students cannot be added to the waitlist after the first day of classes. Instructor overrides can only be made after the second day of class, at which point the instructor’s signature is required on the “Change of Schedule Form ([https://registrar.nmsu.edu/files/2018/03/Change-of-Schedule\\_Updated-02-02-18-1.pdf](https://registrar.nmsu.edu/files/2018/03/Change-of-Schedule_Updated-02-02-18-1.pdf))” to add a course.

## Graduate Registration Requirements for Summer

Students who have scheduled their final examination, or who are completing their thesis during a summer session, must be registered for

one credit hour during the same summer session. In order to graduate during a summer session, the student must have filed the Application for Degree by the deadline posted on the Academic Calendar.

## Repeating Courses for A Change in Grade

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

## Substitutions and Waivers

Students registering for their final semester must have all course substitutions and waivers of required, for their degrees, courses approved before the last day of registration, during the semester in which the student expects to obtain the degree.

## Auditing a Course (No Credit)

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

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

## Academic Performance and Progress Attendance and Student Performance

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

## Absences from Class and Failure to Complete Assignments

Students who must miss class due to accident or illness, or due to other circumstances beyond their control should consult the course syllabus and the instructor for guidance. Students may be administratively dis-enrolled from a course due to excessive absences (consecutive absences in excess of the number of class meetings held within a week or any number of absences which are impairing the student's performance), or for persistent failure to complete assignments. In such cases, the Instructor may recommend administrative dis-enrollment by providing a completed "Student Absence/Lack of Progress Report" form to the Academic Associate Dean. If the Academic Associate Dean agrees with the recommendation of the course instructor, the student will be dis-enrolled from the course. A dis-enrollment has the same effect as a voluntary withdrawal (see "Registration Changes" in this catalog). Any student who has been administratively dis-enrolled from a class may

appeal that decision to the Dean of the College where the course was offered within 10 days after notification of the dis-enrollment.

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

## Classroom Conduct

Each instructor has the authority to establish and enforce reasonable rules of conduct in their courses. A student who engages in behavior that interferes with the educational environment of the class may be administratively dis-enrolled with the approval of the academic department head and academic associate dean for the course, and with notification to the Provost. Any student who has been administratively dis-enrolled from a class may appeal that decision to the Dean of the College where the course was offered within 10 days after notification of the dis-enrollment.

## Student Performance Assessment

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

## Academic Program Assessment

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

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

## Exam Week and Final Examinations

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

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

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

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

## Developmental Evaluation

The academic skill level of all entering first-time students at the time of registration is evaluated based upon ACT scores, SAT test scores, and if available, the NMSU Math Placement Exam score. The student’s eligibility to enroll in university level English and Mathematics courses is dependent upon this evaluation. Any new student may choose to take the MPE to test towards a higher math placement than indicated by the ACT and high school graduation scores. All new engineering students must take the MPE. More information on the MPE is available from the Department of Mathematics website. <https://www.math.nmsu.edu/msc/MPE/overview.html>. Students who have not demonstrated adequate preparation for university level courses are required to take developmental courses. Developmental courses are included on the transcript and will be included in the calculation of the GPA, but the developmental course credits do not count towards a degree.

- **Developmental Courses in English** - Students who score below 15 on the ACT English exam will be placed into appropriate developmental English course or course(s) (prefix CCDE) before enrolling in ENGL 111G (<http://nmsu.smartcatalogiq.com/en/2016-2017/Undergraduate-Catalog/Courses/ENGL-ENGLISH/100/ENGL-111G>). Students who score below 13 on the ACT English will require two developmental courses before enrolling in ENGL 111G (<http://nmsu.smartcatalogiq.com/en/2016-2017/Undergraduate-Catalog/Courses/ENGL-ENGLISH/100/ENGL-111G>).

- **Developmental Courses in Math** - Students who score below 23 on the ACT mathematics exam, and who did not achieve a qualifying score

on the NMSU Math Placement Exam (MPE), will be placed into the appropriate development mathematics course or courses (prefix CCDM). Placement into CCDM course(s) is dependent upon the student’s ACT score and high school GPA. Students are not allowed to enroll in any other math courses at NMSU until successfully completing any requisite CCDM course(s). (As an alternative to the math developmental course(s), students may complete AS 103 with a C- or better, which does earn credit toward a degree.)

## Basic Academic Skills

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

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

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

- ACT English Score of 30
- Coursework - **ENGL 111G**, or equivalent, completed with a grade of C- or higher.

Equivalents: the following are deemed equivalents to ENGL 111G for the purpose of satisfying Basic Academic Skills in English:

- **ENGL 111GH** – completed with a grade of C- or higher
- ENGL 111 M - required for International students who took the TOEFL examination
- CLEP Exam score of 57 or higher in freshman college composition
- English Advanced Placement (AP) Exam score of 3, 4, or 5
- English Composition Transfer Credits - 3 or more credits with a grade of C- or above, transferred from accredited post-secondary institutions (International students may be required to take ENGL 111 M as noted above.)

**Credits from Non-accredited Institutions** - As a general rule, NMSU does not accept credits from non-accredited institutions. Students with 3 or more credits of college-level English composition with a grade of C- or higher from a non-accredited institution may, however, challenge the Basic Academic Skills requirement in English and English 111G course requirement by submitting a theme paper written under the supervision of, and demonstrating achievement of English 111G learning outcomes as determined by, the Department of English.

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

- ACT Mathematics Score of 23
- Coursework – any one of the following courses or course combinations completed with a grade of C- or higher in each course:

- MATH 111 and MATH 112G
  - Any mathematics course numbered 120 or above (prefix MATH)
  - Any one statistics course: A ST 251G, STAT 251G or STAT 271G
- Basic Skills Exam Passing Score - offered twice a semester by the Department of Mathematical Sciences
  - Calculus AB, Calculus BC or Statistics Advanced Placement (AP) Exam score of 3, 4, or 5

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

## Independent Study and Directed Reading Courses

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

## Adjusted Credit Option

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

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

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

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

## Credit by College Level Examination Program (CLEP)

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

## Credit by Examination

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

department in which the course is being challenged. Students may not enroll in a single course, challenge it by examination, and drop it during the drop/add period, unless they enroll in an additional course. In exceptional cases in which a student demonstrates outstanding ability in a course in which he is already registered, he may be permitted to challenge the course. A student desiring to apply for special examination may obtain the necessary forms from the University Student Records Office. The fee for challenging a course is the same as the approved tuition rate. Courses may not be challenged under the S/U option. The special examination privilege is based on the principle that the student, exclusively, has the responsibility for preparing for a special examination.

## Credit for Military Service

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

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

*NOTE: Students submitting military transcripts for credit evaluation must keep in mind the Maximum Time Frame policy. See Financial Aid (<https://catalogs.nmsu.edu/nmsu/general-information/financial-aid-scholarship-services>) Section.*

## Graduate Course Deficiencies

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

satisfactory to the professor), and such courses will not affect the maximum number of S/U graduate credits permitted.

## Short Courses for Graduate Students

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

## Challenging Graduate Courses

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

## Grading University Grading System

Each course department or instructor establishes the system for assessing student performance in achieving course learning objectives.

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

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

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

I- Incomplete work	0
AU- Audit	0

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

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

## Midterm and Six-Week Early Performance Grades

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

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

## Retention of Grading Records

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

## Minimum Grade Requirement for Undergraduate Students

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

## Minimum Grade Requirement for Graduate Students

Graduate degrees require a cumulative graduate G.P.A. of 3.0 or higher. Although B- and C grades (including C+ and C-) earned at NMSU may be counted toward the requirements for a graduate degree in some programs, this grade does not reflect acceptable graduate-level

performance and may cause the cumulative G.P.A. to fall below the 3.0 required for graduate students. Some departments have higher grading requirements for courses in their programs. Students should check with their departments regarding specific course grading requirements for their particular degree program.

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

## S/U Grading

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

### Designated S/U Courses

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

### Election of the S/U Grading Option - Undergraduate Students

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

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

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

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

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

With an approval from their advisor and department head, graduate students in good academic standing may elect the S/U option, at the time

of registration, for courses taken outside the major department, subject to the regulations stated below:

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

## I Grade Designation

The letter grade of I (incomplete) is given for passable work that could not be completed due to circumstances beyond the student's control that develop after the last day to withdraw from the course.

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

To assign an I grade, the instructor must complete the "I grade Information Form" and have the form delivered to the associate dean of the course college. The instructor must indicate on the form whether the student will be given the option to complete the remaining coursework and have the I grade changed to the earned letter grade. If so, the instructor should indicate the steps necessary to complete the remaining coursework. The I grade form should either be signed by the student in person, or the associate dean must send a copy of the document to the student's official permanent address, as recorded in the University Student Records Office, with a notation on the form that the student was not available for signature.

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

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

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

## RR Grade

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

## W Grade Designation

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

## Effect of Change of Grade

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

## Repeating Courses for a Change in Grade

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

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

## Grade Point Average

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

## Grading in Graduate Research

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

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

At the conclusion of the final oral examination, or when the thesis/dissertation is submitted for the final signature of the graduate dean, the

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

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

## Withdrawals

### Withdrawal from a Single Course

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

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

## Leave of Absence from the Graduate School

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

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

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

## Administrative Withdrawals

An administrative withdrawal is initiated for a student who is representing the university at an official out-of-town event and becomes effective when the student returns from the event or five class days after the signed drop slip gets to the dean's office.

## Military Withdrawal

New Mexico State University understands that our military and Veteran students may be called to active duty, specialized training, or disaster relief efforts with little notice. U.S. active duty military students wishing to withdraw from all their classes must present their orders and their request for full withdrawal, as indicated below. However, the below policy does not pertain to a student's basic and/or annual training. A student who has an order for training is encouraged to formally request,

through the proper military chain of command, a postponement of their orders until the summer or the end of the semester they are currently enrolled in. If a student's request for postponement is denied, the student may then follow the below steps but must provide documentation that their postponement request was formally denied.

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

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

## Student Medical Withdrawal

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

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

## Medical Conditions of a Family Member Withdrawal

A student who is withdrawing because of a medical condition of an immediate family member must submit a letter from the family member's attending physician. This action applies to all courses a student is registered for in the affected semester(s). The student cannot select which courses they want to withdraw from and which they want to remain registered for when exercising this option. It must be on official letterhead with an original signature, stating the date(s) within the semester that the student's immediate family member was under medical care and that the student must withdraw to attend to the immediate family member's medical condition. This letter must be submitted within

the semester or no later than one academic year at the end of the term for which the withdrawal is being requested.

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

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

## Withdrawal from NMSU

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

1. Initiated by the student (using the Withdrawal form)
2. Have all necessary signatures (as indicated on the form)
3. Be approved and processed through the Registering Office, located on the Las Cruces Campus

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

Applicable dates for the last day to withdrawal are published on the approved university academic calendar or under important dates at: <http://registration.nmsu.edu>.

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

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

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

## Graduation and Commencement Graduation Requirements

For specific graduation requirements for any degree offered at NMSU please see the Degrees, Majors, Minors and Other Academic Programs of Study (p. 53) section, as well as the departmental sections for those requirements. These requirements will include the minimum GPA, total credits and specific course requirements for graduation.

## Applying for a Degree

Any students that are in their final semester of classes are considered degree candidates and are required to submit an "Application for Degree" as well as pay graduation fees for each degree being sought. The application for Degree form is available online through the MyNMSU website. It must be completed and submitted by the designated deadline for that semester. The fees for the Las Cruces campus are all listed in the Tuition, Fees and other Expenses (p. 26) section of the catalog, once a student submits the application the fee will be included in the total cost for the semester or session in which the candidate anticipates completing their degree requirements.

If degree requirements are not completed during the semester/ session the student originally applied for, the student must then reapply and pay the appropriate fees. A \$25 late fee applies to applications received after the application deadline, and no applications will be accepted after the posted deadline date.

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

## Attendance at the Commencement Ceremony

Commencement is a symbolic ceremony. Participation in commencement does not, in itself, mean that a student is considered an NMSU graduate. In order to be awarded a degree, a student must fulfill university requirements as determined by academic colleges. The degree will reflect the graduation date from the application for degree in which all degree requirements were determined by the academic colleges.

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

1. Receive permission the Dean of their college
2. Show a minimum cumulative grade-point average of 2.0
3. Only need 12 or fewer credit hours to complete their degree requirements
4. These remaining credit hours must be offered in the upcoming summer schedule of classes

- Submit a degree application and approved petition form (available in the Dean's office) by the last day to apply for a degree in the spring semester.

## Academic Regalia

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

## Diploma

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

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

## Academic Standing, Probation and Suspension

### Undergraduate Academic Standing

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

### Undergraduate Academic Warning

Issued only once, the first time a student's cumulative GPA falls below a 2.0 while in good academic standing. The relevant Associate Dean for Academics or Campus Academic Officer (CAO) will send the student a letter detailing the consequences should the cumulative grade point remain below a 2.0 at the conclusion of the semester. A student on Academic Warning remains eligible for all extracurricular activities as governed by the rules of the specific activity.

While under Academic Warning the following restrictions apply:

- The student may be required to enroll in a 3-credit hour special study skills/time management course specifically designed for students

on Academic Warning, or an equivalent course approved by the appropriate associate dean or CAO of their campus.

- Students will be required to enter into a contract with their advisor, approved by their department head that places further stipulations on Academic Warning. The contract may include, but is not limited to the following:
  - The student may be required to take at least one repeat course to try to improve their GPA.
  - Except for the special study skills/time management course, the student's coursework may be restricted to their major.
  - The student may be required to get tutoring help.
  - The student may be required to see an academic counselor on a specified time schedule.
  - The number of credit hours a student may register for may be restricted (due to extenuating circumstances such as the student's workload commitments).

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

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

## Undergraduate Academic Probation I

This occurs when a student under Academic Warning has a semester GPA less than 2.0, and the cumulative GPA remains below 2.0 at the conclusion of the semester or if the student maintains a semester GPA greater than 2.0 while on Academic Probation I but the cumulative GPA is still less than 2.0.

Under Academic Probation I the following conditions apply:

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

The student must maintain a semester GPA equal to or greater than 2.0 until such time that the cumulative GPA is greater than 2.0 at which time the student goes back to good academic standing. Until the transition happens the student remains on Academic Probation I. The student will be placed on Academic Probation II if he/she is unable to maintain a 2.0 semester GPA, and the cumulative remains below a 2.0 GPA, while

under Academic Probation I. A student on Academic Probation I remains eligible for all extracurricular activities as governed by the rules of the specific activity.

## Undergraduate Academic Probation II

Academic Probation II is issued in two ways.

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

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

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

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

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

### Continuing in Probationary Status

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

### Removal of Academic Probation

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

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

## Academic Suspension

When a student does not achieve a semester 2.0 GPA or higher, and the cumulative remains below a 2.0 while under Academic Probation II, they are placed on Academic Suspension. Students under Academic Suspension are not allowed to take NMSU courses while under suspension. Students on Academic Suspension must sit out a minimum of 1 semester and then petition the Provost or designee to be removed from Academic Suspension. At this time the suspension status will

be evaluated for possible removal. Should the suspension be lifted, the student is placed on Academic Probation II until such time as the cumulative GPA equals or exceeds a 2.0. At the discretion of the Provost or designee, the student will enter into a contract approved by the Provost or designee and the student's Dean or CAO, setting stipulations to have the suspension removed. Failure to adhere to the contract will return the student to Academic Suspension.

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

### Rescinding Academic Suspension for Summer Attendance

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

A certification of eligibility to attend summer sessions at NMSU after a spring semester Academic Suspension is available to the suspended student who wishes to attend summer sessions at other institutions.

## Graduate Academic Probation and Suspension

Graduate Academic Standing is based on both the student's semester GPA and cumulative GPA. The student must maintain a cumulative GPA of 3.0 or higher to remain on Graduate Academic Good Standing.

**Graduate Academic Probation I:** A graduate student is placed on Graduate Academic Probation I when a graduate student's semester GPA is above a 3.0 and the cumulative GPA drops below 3.0; or when the semester and cumulative GPA's drop below 3.0 and the previous academic standing is Graduate Academic Good Standing.

**Graduate Academic Probation II:** Is issued when a graduate student semester GPA and the cumulative GPA drops below as 3.0 and the previous academic standing is one of Graduate Academic Probation I or Graduate Re-admit on Probation I.

**Graduate Academic Suspension:**

If the graduate student is unable to maintain a semester GPA of 3.0 or higher and the cumulative remains below 3.0 GPA while under Graduate Academic Probation II, the student will then be placed on Graduate Academic Suspension.

Students on Graduate Academic Suspension are barred from enrolling in graduate level courses at NMSU while on Suspension. Graduate

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

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

## Academic Misconduct and Grievances Student Academic Code of Conduct

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

While it is important to refer to the detailed governing rules in the ARP, the process is summarized as follows: An institution-wide Academic Conduct Officer is responsible for processing each case of alleged academic misconduct. The accused student is provided notice of the allegation and has the right to participate during the fact finding process.

The student may contest the investigative findings or sanction before a neutral third party hearing panel member. Either party to the matter has the right to a final appeal of the findings or a Level II sanction to the Office of the Provost.

The SACC distinguishes between Level I Sanctions and Level II sanctions, depending upon the severity of the offense and other factors. The Level I sanction includes a formal warning. Offenses by graduate students and repeat offenses, even if less serious are subject to a Level II Sanction.

Level II sanctions include a notation of academic misconduct on the student's academic transcript.

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

### Policies

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

### Examples of Academic Misconduct and Report Form

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

### Flowchart of Procedures

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

## University Student Records Office Privacy Rights

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

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

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

## Social Security Numbers in Student Records

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

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

## Change in Demographic Information

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

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

4. **Gender Update:** students will need to bring a Government Issued ID (drivers license, state ID card or valid passport) and a Revised Birth Certificate

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

For more information about the specific documents that are needed please contact the Registrar’s Office at (575) 646-3411.

## Changes in Residency Status for Tuition Purposes

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

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

For specific information about the process of petitioning for In-State Residency or for information about who is eligible for residency for tuition purposes please visit the <https://registrar.nmsu.edu/residency/> website or the University Student Records Office on the Las Cruces campus.

## Official Transcripts

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

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

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

## Purging of Student Files

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

# THE GRADUATE SCHOOL

A number of academic departments of the university have a long history of providing formal graduate study. The first master's degree from NMSU was awarded in 1896. In 1921, the president of NMSU appointed a committee to oversee graduate study. The Graduate School was formally established in 1956 with a full-time dean, and in the same year, 57 master's degrees were awarded.

The Graduate School mission is to facilitate the exchange of ideas and the creation of knowledge, while fostering academic excellence. The Graduate School promotes a high-quality learning environment that embraces diversity. New Mexico State University is one of the few research extensive universities that reflect Hispanic, Native American, and other American cultures and the world. Our international students from Latin American, Asian, African and European countries add to the richness of our diversity. The quality of life for our students is of critical importance to the Graduate School and NMSU. We cultivate the marriage of academic, professional and personal skills while helping students graduate in a timely manner.

## Policies

Since graduate degrees are awarded for attainment in scholarship, the requirements stated in this catalog are to be considered as minimal. The major department or the dean of the graduate school may make additional requirements as deemed necessary for each candidate. Each student's program is subject to the approval of the respective department head. Responsibility for securing approval of the proposed program of study rests with the student. Frequent consultation with the advisor is essential to satisfactory progress toward degree completion.

## Graduate Degree Programs

For a full listing of the Graduate Programs offered at New Mexico State University; please see the Graduate Admissions webpage <http://gradschool.nmsu.edu/graduate-programs/>.

## Admission for Graduate Students

A student seeking admission to graduate school at New Mexico State University must hold a minimum of a bachelor's degree or an advanced degree from a regionally accredited institution. The program of preparation should be substantially equivalent in the distribution of academic subject matter to the requirements for a comparable degree at NMSU.

No student is officially admitted into a graduate program until a Certificate of Admission has been issued by the Graduate School. Although the Graduate School considers this certificate valid for a one year period, academic departments may require re-application if the admitted applicant does not enroll in the semester noted in the certificate.

Formal application is required of all prospective students, including graduates of NMSU, who seek admission to a graduate program.

- Students must submit: the Application for Admission as well as other supplemental documents required by the academic department.
- Supplemental documents may include, but are not limited to, unofficial college transcripts, test scores (TOEFL, IELTS, GRE,

and GMAT), statement of purpose, writing samples, and letters of recommendation.

If a student is recommended for admission by the academic department, the student will be required to submit official transcripts, test scores, and the appropriate application fee directly to the Graduate School. Other official documents may be required. Official transcripts must be sent directly from the prior colleges or university directly to the Graduate School.

## Categories of Graduate Students

A student seeking admission to a graduate program is assigned one of the following categories based upon previous academic performance:

### Doctoral Student

To be considered for admission to a doctoral program, an applicant must have a minimum grade-point average of 3.0. Some doctoral degree programs also require a master's degree or its equivalent.

### Master's Regular

An applicant whose scholastic record is satisfactory will be admitted as a regular student. This classification includes:

1. an applicant whose grade-point average is greater than or equal to 3.0, or a grade-point average greater than or equal to 3.0 in the last half of undergraduate work,
2. an international applicant whose grade-point average (or its equivalent) is greater than or equal to 3.0,
3. a continuing graduate student whose grade-point average is greater than or equal to 3.0, or
4. a student with prior graduate work at another institution whose minimum grade-point average is 3.0.

### Master's Provisional

An applicant whose scholastic record is not satisfactory can be admitted as a provisional student. Students admitted with this classification can be either:

1. transferring graduate students whose cumulative grade-point average is less than a 3.0
2. Students whose grade-point average the last half of undergraduate work is less than a 3.0, but who does have a minimum grade-point average of 2.5

A student admitted provisionally must complete his or her first three courses, a total of 9 credits of graduate work, with a minimum grade-point average of a 3.0. A provisional student who does not meet the 3.0 grade-point average after at least 9 credits of graduate work is subject to dismissal. A student admitted on a provisional basis is prohibited from working as a teaching assistant. However, he or she may work as a research assistant or a grader for one semester. A provisional student can be employed for one semester as a grader. To hire a provisional student, departments must submit an official letter to the Graduate School requesting permission.

### Master's Undeclared

An applicant that has not decided on a specific graduate degree program and has an undergraduate minimum grade-point average of 2.5 may be considered for admission as an undeclared master student. International students with an F-1 visa are not eligible for undeclared master status. Information regarding restrictions as an undeclared master student can be obtained from the Graduate School.

Only undeclared regular status students who meet all Title IV eligibility requirements are eligible to receive federal financial aid for one consecutive 12-month period beginning the first term of enrollment. Questions about financial aid and undeclared master's should contact Financial Aid and Scholarship Services. An applicant admitted as an undeclared master is not eligible to receive a graduate teaching assistantship.

### Undeclared Student Enrollment Restrictions

- Students in this standing are restricted to enrolling in a maximum of 9 graduate credit hours. To continue enrollment the student must apply and be admitted into a degree-seeking program.
- Course restrictions placed by the graduate department may constrain enrollment by an undeclared student.
- An undeclared master student is restricted to transferring 9 graduate credit hours to a degree program.

### Change of Status from Undeclared to a Degree Program

Changing status from an undeclared master's to a degree program requires acceptance to the department by completing a new application for admission.

- If the student has nine graded graduate credit hours, the cumulative minimum grade-point average (GPA) must be 3.0 for the request to be considered.
- Undeclared applicants admitted to a degree program which have fewer than nine graded graduate credits and the undergraduate GPA is between 2.5 to 2.9 the recommendation for admission will be provisional student status.
- If the undergraduate GPA is 3.0 or greater, the admission recommendation will be regular student status.

## Admission to a Graduate Certificate Program

The graduate certificate program of study is designed to develop or enhance a focused area of expertise. The primary purpose of a graduate certificate program is to provide specific skill training to meet employment needs locally, regionally, nationally and globally.

A graduate certificate is a focused collection of courses, consisting of 12-18 credits, successfully completed by a student in a given discipline or a set of related disciplines. A graduate certificate is not an official graduate degree of NMSU. A student that successfully completes a certificate program at the graduate level will receive a certificate of completion statement on his or her official transcript and a formal certificate from the Graduate School. A student has three years to complete a graduate certificate program.

The graduate certificate program is offered to both currently enrolled, degree-seeking students and students who enroll solely to obtain a certificate. Currently enrolled degree-seeking students must apply separately to the graduate certificate program. Students wishing to enroll solely in the certificate program must still meet all admissions criteria. Successful completion of a certificate program does not guarantee admission into a graduate degree program.

A student enrolled in a graduate certificate program cannot transfer credits from another institution towards the completion of the program. However, transfer credits taken in a graduate certificate program may be applied towards a graduate degree program in the same area of focus. The number of transfer credits will be determined by the program of study

or official degree audit. The time limit on transfer credits is 5 years after the completion of the certificate.

Students only enrolled in a graduate certificate program are not eligible for a graduate assistantship.

### Graduate Certificate Student

A student enrolled in a certificate program is not automatically enrolled in a graduate degree seeking program at NMSU. The status will change if he or she applies and is accepted to a graduate degree program. A student enrolled in a graduate certificate program is not eligible for a graduate assistantship.

## Application Dates and Deadlines

Contact the graduate degree program for published application deadlines. If the graduate program does not publish a deadline, the Graduate School encourages the applicant to apply by March 15th for fall enrollment and by October 15th for spring enrollment to be considered for financial support. The Graduate School will continue to accept applications 30 days prior to the first day of classes.

## Transcripts

An applicant is required to arrange to have one official transcript from each institution attended sent directly to the Graduate School.

If the applicant's undergraduate coursework is not complete at the time of application, she or he must submit a transcript showing the completion this course work directly after the degree has been granted. No application materials will be returned to the applicant.

## Standardized Tests

Certain graduate programs may require standardized test scores for admission. An applicant may be required to take one or more of the following examinations as determined by the academic department:

- Graduate Record Examination,
- the Miller Analogies Test,
- the Graduate Management Admission Test.

(See academic department description for required testing.)

## Readmission

An NMSU student who has been out of school for more than two consecutive terms is required to make formal application for readmission to the institution. The application will be reviewed by the academic department and the Graduate School. The application should be submitted at least 30 days prior to the start of the semester.

A student who has attended other institutions during the absence is required to submit official transcripts to the Graduate School prior to the date of registration and be eligible to return to the college or university last attended. Readmission status and academic standing will be determined by previous NMSU academic standing. Academic performance at other institutions attended during the applicant's absence from NMSU will be taken into consideration in determining the student's admission status.

## Renewal of Application for Admission

The admission credentials for an applicant who does not register for the semester admitted are retained at the Graduate School for a period

of one calendar year from the date of application. At the end of this period, credentials are discarded. A student wishing to renew his or her application after the one-year lapse must submit a new application.

## Denied Admission

The Graduate School or the department may deny admission if the scholastic record or program of study is judged inadequate. If denied admission by a specific academic department, the applicant may be eligible to seek undeclared status as described in Categories of Graduate Students. If denied by the department, the student may wish to contact the department for additional information.

Admission may be denied to an otherwise qualified applicant when the desired program lacks resources to accommodate additional enrollment.

A student who is denied admission to one program and wishes to be considered for another program must complete a new application for the second program.

Application documents are retained by the Graduate School for one calendar year.

## Non-Degree Admission

Non-degree admission is designed to meet the needs of an applicant who does not wish to pursue a degree or who has not yet completed the application process to a specific department. Academic advising for non-degree students is obtained from the academic department. No more than 9 graduate credits earned in non-degree status may be transferred to a graduate degree program. NMSU only recognizes graduate credit for non-degree work from the University of New Mexico (UNM). Transfer credit is restricted to 6 credits with the approval of the appropriate department, the college dean, and the graduate dean. A student classified as non-degree is not eligible to receive financial aid, student employment, or institutional tuition waivers; nor is he or she eligible to participate in student government or intercollegiate athletics; and is not eligible to receive benefits from veterans' programs.

## Visiting Student

A visiting student is a student taking graduate credit to transfer to his or her parent institution. An Application for Admission to the Graduate School must be submitted 30 days prior to registration. The student is required to submit unofficial transcripts; however, the academic department must concur and admit a visiting student. Visiting students are not eligible for undeclared status or for graduate assistantships.

## Out-of-State Students and Legal Jurisdiction

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

## Contact Information

For more information, contact:

Graduate School, MSC 3-GS  
New Mexico State University  
PO Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-5746

<http://gradschool.nmsu.edu/>

## International Graduate Students

### English Proficiency for Admission

- TOEFL 79 IBT; 550 PBT
- 6.5 IELTS

International students admitted with TOEFL 68 to 78 IBT, 520 to 549 PBT or 6.0 IELTS are required to sit for the English Placement Exam prior to beginning academic coursework. (The International Student and Scholar Services Office arranges this test upon arrival). If the results of the English Placement Exam do not meet the requirements for academic coursework the student may be required to take additional academic English classes (SPCD 110 and/or SPCD 470).

### English Proficiency

International students that wish to become teaching assistants must demonstrate that they are proficient in the English language. This is done by participating in an International Teaching Assistant Screenings (ITAS). The purpose of the ITAS exercise is to determine whether candidates will be required to take COMM 485 International Teaching Assistant Development before being allowed to be assigned a teaching assistant position.

The ITAS requires that a teaching assistant candidate deliver a short, ten minute teaching demonstration of a typical introductory undergraduate level course in a specific area relevant to the his or her area of studies. The demonstration is observed by CELP faculty and an actual undergraduate student.

Based on the results of this exercise, a full report by the CELP observers will be presented to the head of the department in which the graduate student wishes to be a teaching assistant.

- COMM 485 International Teaching Assistant Development not required
- COMM 485 International Teaching Assistant Development recommended, but not required
- COMM 485 International Teaching Assistant Development required

Ultimate authority to enforce the recommendation lies with the Department Head.

Preferably during Summer Session II, or before the start of the first semester of enrollment, all international students that wish to be considered for a teaching assistantship must take the ITAS, which is administered by the CELP. The ITAS can be waived for international students who hold a degree from an accredited university in the United States, or a country where English is the official language of instruction. Departments also have the discretion to allow waivers for special circumstances.

### Enrollment

All international graduate students on F-1 or J-1 visas are required to comply with Department of Homeland Security regulations governing maintenance of status related to full-time enrollment and making normal progress toward completing a degree. Therefore, all international graduate students are required to enroll in 9 or more credits (exclusive of audited work) during fall and spring semesters.

## Transfer of Graduate Credits into a Degree Program

1. Graduate credits taken at NMSU as undergraduate electives may be transferred to the student's graduate program at NMSU.
2. Graduate credits from another university may be transferred to NMSU, provided the credits were earned on the campus of an accredited institution.
3. Transferred course work (credit and hours) is maintained separately from NMSU course work.
4. Immediately after initial enrollment in the Graduate School, students must submit forms to obtain formal permission from their advisor, department head, and the dean of the Graduate School to transfer graduate-level course work. The department has the responsibility to accept or reject any number of transferred credits based on such elements as whether the work fits into a logical program for a degree, if grades of A or B have been earned in the courses proposed for transfer, and any other elements it deems relevant. Credit granted for work done at another institution is tentative until proven by satisfactory work in residence. The department may also require work to be validated by examination.
5. Transfer credits must meet the same time-limit requirements (seven years) as master level graduate classes at NMSU.
6. Course work taken at other institutions after initiation of Graduate School at NMSU must have prior approval of the department head and the dean of the Graduate School if such work is to be transferred. All requirements as to accreditation, level, grades and other elements described for initial transfer work will apply. Request for Transfer of Credit forms are available online at [http://provost.nmsu.edu/gradschool/wp-content/uploads/sites/5/2015/04/transfer\\_of\\_credit\\_form.pdf](http://provost.nmsu.edu/gradschool/wp-content/uploads/sites/5/2015/04/transfer_of_credit_form.pdf)

## Graduate Certificates

Students enrolled in certificate programs may not transfer credits from another institution towards the completion of the certificate program offered by NMSU. However, they can transfer credits taken in a graduate certificate program at NMSU into a graduate degree program at NMSU, provided that the courses will lead towards a graduate degree in the focused area of the certificate program. The number of transfer credits will be determined by the program of study. The time limit on course transfer is five years after the completion of the certificate.

## Master's Level

In order to meet residency requirements at the master's degree level, students must take at least 50 percent of their required coursework at NMSU.

## Masters of Fine Arts

Before consideration for candidacy, the department head and the graduate advisor will determine the number of transferable credits from a previous graduate program.

## Specialist in Education Degree

A maximum of 6 graduate credits earned at another approved institution may apply to the Specialist in Education degree. Transfer credits must have been earned during the five-year period prior to completion of the specialist in education degree.

## Doctorate Level

At the doctoral level, students may transfer course work that logically fits into the program of study.

## Funding Opportunities for Graduate Students

The Graduate School offers awards, assistantships and fellowships to qualified graduate students. All awards require faculty nominations. Continuing and newly admitted students can request either a faculty member or the department head to nominate them for the awards of the Graduate School. In selecting individuals for any assistantship or fellowship and in the administration of appointments, New Mexico State University will not discriminate on grounds of age, ancestry, color, disability, gender, national origin, race, religion, sexual orientation or veteran status. The University limits the number of years a student may be supported on funds from the state of New Mexico. Departments may place additional limitations on the years of support. The student must be admitted to the Graduate School before a request for an assistantship or fellowship will be considered by the department or the Graduate School. For detailed information, application process and deadlines please consult <http://gradschool.nmsu.edu/ga-resources/> (<http://gradschool.nmsu.edu/ga-resources/>)

A student should check Graduate Assistant Employment Guidelines of the Graduate School at <http://provost.nmsu.edu/gradschool/wp-content/uploads/sites/5/2017/11/Graduate-Assistant-Handbook-2017-2018.pdf>. Departments may place additional limitations on the years of support.

## Assistantships

Graduate assistantships, including teaching and research, offered by New Mexico State University are awarded primarily by the students' academic department. Employment guidelines may be found at: <http://provost.nmsu.edu/gradschool/wp-content/uploads/sites/5/2017/11/Graduate-Assistants-16-17.pdf>.

Students with assistantships must ensure that they are enrolled in, as well as successfully complete, 9 graded credits for full-time status. Graduate assistants should take no more than 15 course credits per semester. Students must also maintain a 3.0 grade-point-average. Courses taken for audit may count for the total course load, but may not be counted in the minimum graduate assistant course load requirement. If course deficiencies are identified, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at NMSU to be eligible for a graduate assistantship. The duties of a graduate assistantship normally require about 20 hours per week (full-time, fall and spring) of student's time.

## Teaching Assistantships

A student seeking appointment as a teaching assistant will be required to demonstrate proficiency in communication skills necessary for satisfactory service in the classroom. All graduate students awarded an assistantship must complete the online mandatory orientation offered by the Graduate School. Departments may also require students to complete workshops/orientations in order to qualify for assistantships.

Eligibility for teaching assistantships includes:

- Acceptance by and subsequent registration in the Graduate School and academic department
- Classification as a "regular" graduate student

All international students seeking a teaching assistantship must demonstrate proficiency in English and competency in pedagogy. Prior to the first semester in which the teaching assistantship is to be received, international students must undergo the NMSU International Teaching Assistant (ITA) screening administered by the Center for English Language Programs (CELP) on behalf of the Graduate School. Students who pass the screening exam are immediately eligible for assignment to a teaching assistantship. Those who do not pass the screening exam must enroll in and satisfactorily complete COMM 485 International Teaching Assistant Development before being eligible for a teaching assistantship. To aid those incoming international students who plan to teach in the fall semester, COMM 485 International Teaching Assistant Development is offered in the summer. International graduate students wishing to hold a teaching assistantship should check with their department to determine when they should arrive on campus to meet the screening requirement. International students who don't pass the screening exam may be eligible to serve as graders for their academic departments. The academic departments must receive approval from the Graduate School in order to hire these students.

### **Assistantships for Provisional Graduate Students**

Graduate students accepted on a provisional basis cannot serve as teaching assistants. However, they can serve as research assistants. Eligibility includes:

- Acceptance by and subsequent registration in the Graduate School and academic department
- Classification as a provisional graduate student
- Enrolling in and successfully complete 9 graded credits with a minimum of 3.0 GPA.
- Funded on research projects of the faculty of NMSU

Provisional students can also be hired as graders for one semester. The department must submit a formal letter to the Graduate School requesting that the student be allowed to work as a grader. The Graduate School can approve or deny the request.

### **Diversity Graduate Assistantships**

The diversity awards are allocated to departments on a competitive basis to help increase the diversity and quality of the student body. Departments will commit matching funds to support these awards for the student. The diversity award can be used to recruit domestic students. Please note that the award is for an academic year. Departments will need to commit funds to the selected student for at least one additional semester or preferably a year. The selected student must be admitted to the department prior to applying for the diversity award.

### **Fellowships**

The Graduate School maintains a Fellowship and Grant Information webpage <http://gradschool.nmsu.edu/funding-opportunities/> providing a database of grants, fellowships and assistantships for graduate students. The university offers a number of fellowships available to both new and continuing students.

### **Graduate Assistant Tuition Fellowships**

As an opportunity for departments to recruit outstanding graduate students to their programs, the Graduate School awards tuition fellowships to graduate assistants. Master's degree students will receive up to two years of support and doctoral degree students will receive up to three years of support. In order for students to qualify for a second and third year of support, they must maintain their status as graduate assistants for the duration of the tuition fellowship period. These awards

are for students receiving 10 hour or 20 hour graduate assistantships. Students must be enrolled in and successfully complete 9 graded credits with a minimum of 3.0 GPA. The tuition fellowships do not include fees.

### **McNair Graduate Assistantships**

The Graduate School wishes to support and recognize the success of the McNair program by offering several McNair Graduate Assistantships for one academic year with a match of one year from a department.

### **Merit-Based Enhancement Fellowships for Current Graduate Assistants**

To help departments reward outstanding graduate assistants, the Graduate School offers Merit-Based Enhancement Fellowships to graduate assistants who are engaged in the teaching or research mission of New Mexico State University. The amount of the award is \$4,000 for an academic year. Nominations must come from faculty.

### **The Mike Watts Outstanding Leadership Graduate Fellowships**

The Graduate School encourages faculty to nominate outstanding graduate assistants for a Mike Watts Outstanding Leadership award. The fellowship is made available through the generosity of the family and friends of Michael E. Watts. The Watts Fellowships are available to graduate assistants from any area of Graduate School.

If awarded, the fellowship will be paid as salary supplement to the regular assistantship. Please note that for those students who also receive financial aid, the fellowship can have an impact on the amount of financial aid received. The Graduate Council Fellowship Committee will review the applications and select recipients.

### **Outstanding Graduate Assistantship Award**

We also offer Outstanding Graduate Assistant awards of \$2,000 to recognize the contributions of graduate assistants to the teaching and research mission of New Mexico State University. The awards allow faculty to show appreciation for the excellent work of graduate assistants. Current graduate assistants must be nominated by their faculty to be considered for the awards.

### **State of New Mexico Department of Higher Education (NMHED) Graduate Scholarship Programs**

The State of New Mexico Higher Education Department Graduate Scholarship Program offers Graduate Fellowships/Assistantships for women and minority persons who are citizens or permanent U.S. residents and who are a first year student or a student that is beginning graduate studies in any graduate department at the master's or doctoral level at NMSU. The selected student must be admitted to a graduate program prior to applying for this award.

NMHED fellowships carry stipends of \$7,200 per annum and matched with half-time (10 hours per week) teaching assistantship provided by the student's department for a total award of \$15,800.

#### **Eligibility:**

- Priority will be given to NM students from those groups with the most severe under-representation and students with the greatest financial need.
- A citizen of the United States or permanent resident.
- Agree to serve in an unpaid internship or assistantship at the eligible institutions, a government agency or private industry approved by his major department for ten hours per week during the academic year.

- Eligible according to a standard needs analysis or financial aid officer's professional judgement.

The total amount of this award is based on the salary for a 20 hour graduate assistantship and usually increases from year to year, based on raises awarded by the State of New Mexico.

Fellowships are available for two years for master's students and four years for doctoral students. One of the NMHED fellowships is, when possible, designated for a McNair Scholar. The nomination process can be found at: <http://gradschool.nmsu.edu/funding-opportunities/>.

In order for the student to establish financial need, students must complete a Free Application for Federal Student Aid (FAFSA) form available online in the Financial Aid Office. This form is not to be returned to the Graduate School. The results will be sent to the student and the Financial Aid Office. **Students must have a complete file and have been approved for financial aid to be considered for this fellowship.**

Preference will be given to those students that have a current FAFSA form on file at the NMSU Financial Aid office.

## Graduate Assistants Salaries and Tax Withholding Guidelines

Internal Revenue Service tax withholding guidelines require undergraduate and graduate students employed through New Mexico State University to maintain at least 6 credits of course work during the fall and spring semesters and 3 credits of course work for summer sessions to be eligible for the student FICA tax exemption. Student employees who do not meet this requirement during any given pay period will be subject to Social Security taxes at the rate of 6.2% and Medicare taxes at the rate of 1.45%. Salaries for graduate assistants in 2017-2018 are as follows:

Level	Salary
I- G1	\$16,964
II- G2	\$17,368
III- G3	\$17,772

Level I (G1) - Applies to regularly enrolled students pursuing a master's degree. This level is also for a first year student seeking a doctoral degree who does not currently hold a master's degree. On the doctoral student becomes a second year student and passes their qualifying exam, they can obtain support as a Level II (G2) student.

Level II (G2) - Applies to students

1. pursuing the education specialist or doctoral degree who have passed the qualifying exam or
2. who have a master's degree in the same or cognate field and the recommendation of the head of their major department.

Level III (G3) - Applies to a doctoral student who has passed the comprehensive examination and has advanced to candidacy.

Graduate assistants employed at least ten hours per week will be given in-state tuition during the first 12 months of tenure if Human Resources approve the hiring process prior to census data (stated by the University Student Records Office as the third Friday of the semester each spring and fall semester).

If New Mexico resident status has not been established by the time of any reappointment, the graduate assistant may be subject to non-resident tuition rates.

Applications for state residency may be obtained in the University Student Records Office located in the Educational Services building.

## Social Security Numbers in Student Records

As required by law, social security numbers are collected from prospective and current students who

1. plan to seek employment on campus or
2. wish to receive financial aid.

In addition, the university is mandated by federal tax regulations to provide tuition and fee payment information to the student and the Internal Revenue Service, so that applicable educational tax credits may be computed. The social security number will be necessary to submit this tax reporting. The social security number is a confidential record and is maintained as such by the university in accordance with the Family Educational Rights and Privacy Act.

In order to be employed by New Mexico State University all students must have obtained a social security number within eight weeks of being hired or risk losing their assistantship.

When an official social security number is issued to an international student, it is the student's responsibility to inform Human Resources or the University Student Records Office as soon as possible.

## Hourly Work

Eligibility for student payroll requires that a graduate student

1. be admitted to the Graduate School as well as to a department,
2. have a GPA of 3.0, and
3. be enrolled for at least 9 graded credits.

A student may not work more than 20 hours per week during the academic year. Students looking for current job postings should check with Career Services, Garcia Annex, Room 204; or visit <http://careerservices.nmsu.edu/>.

Students not classified as residents of New Mexico but working at an hourly rate are not eligible to receive in-state tuition.

## Contact Information

For more information, contact:

Graduate School, MSC 3-GS  
New Mexico State University  
PO Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-5746  
<http://gradschool.nmsu.edu/>

## Postdoctoral Fellowships

Those individuals who are exemplary scholars, who have recently been awarded a doctoral degree, but who wish to continue their education and research experience under the direction of a professor at New Mexico State University are classified as postdoctoral. The postdoctoral fellowship is a regular professional appointment normally for one or

two years. Under no circumstances will an individual remain in this classification for more than three years.

Postdoctoral fellowships are advertised and applications are submitted to the hiring department in compliance with the guidelines for hiring professional staff, but without the requirement for a position description questionnaire. An "E-Hire" staffing authorization request must be submitted to the office of Human Resources by the hiring department. No offer of employment may be made until approval has been given by Human Resources.

A postdoctoral fellow has the following privileges:

- may take 6 credits in spring and fall semesters, 4 credits per summer session without tuition charge
- is eligible to purchase an employee parking permit
- is eligible for other employee benefits available to regular employees, including annual and sick leave, as well as health, dental, and life insurances
- may purchase athletic tickets, activity tickets, and gymnasium privileges
- is eligible for library privileges

Persons classified as postdoctoral fellows pay Social Security and New Mexico State Educational Retirement.

# COLLEGE OF AGRICULTURAL, CONSUMER, AND ENVIRONMENTAL SCIENCES

Dean and Chief Administrative Officer- *Rolando A. Flores*

Interim Associate Dean and Director of Academic Programs - *Gerald M. Hawkes*

Associate Dean and Director of the Cooperative Extension Service - *Jon C. Boren*

Interim Associate Dean and Director of the Agricultural Experiment Station - *Natalie Goldberg*

Scholarship Coordinator - *Lee-Ann Carter*

Requirements for Bachelors of Science in Agriculture; Conservation Ecology; Family and Consumer Sciences; Genetics; and Hotel, Restaurant and Tourism Management

1. Courses required of all qualifying for this degree.
2. General education requirements.
3. Courses to be taken in the particular field of your major interest.
4. Free electives sufficient to bring the total number of credits to a minimum of 120 semester credits. Of this total at least 48 semester credits must be in upper-division courses (numbered 300 or above).
5. A grade-point average of no less than 2.0.
6. All students will have an official degree check on file in the Academic Dean's Office prior to start of senior year.

## Typical Curricula in Agriculture

The following suggested curricula are presented for your guidance. With the consent of the head of the department in which you are majoring, you may select electives and changes in a curriculum except in the case of constants.

## Bachelor Degrees

**Bachelor in Conservation Ecology**

**Bachelor of Science in Agriculture**

**Majors in:**

- Agricultural Biology (p. 118);
- Agricultural Economics and Agricultural Business (p. 96);
- Agriculture and Community Development (p. 90);
- Agriculture and Extension Education (p. 90);
- Agronomy (p. 158),
- Animal Science (p. 108);
- Fisheries and Wildlife Science (p. 142);
- General Agriculture (p. 84);
- Horticulture (p. 147);
- Natural Resource Economics and Policy (p. 97);
- Range Science (p. 109);
- Soil Science (p. 164);
- Turfgrass Science and Management (p. 166);

- Programs in also in Preveterinary Medicine (p. 84) and Preforestry.

**Bachelor of Science in Environmental Science**

**Bachelor of Science in Family and Consumer Sciences**

**Majors in:**

- Clothing, Textiles, and Fashion Merchandising (p. 130);
- Family and Child Science (p. 131);
- Family and Consumer Sciences Education (p. 132);
- Human Nutrition and Dietetic Sciences (p. 134)

**Bachelor of Science in Food Science and Technology**

**Bachelor of Science in Genetics**

**Bachelor of Hotel, Restaurant and Tourism Management**

## Masters Degrees

**Master of Agriculture**

**Major in Agriculture:**

- Concentration in Agribusiness (p. 98)
- Concentration in Domestic Animal Biology (p. 111)

**Master of Arts**

Major in Agricultural and Extension Education: (p. 91)

**Master of Business Administration**

**Major in Business Administration:**

- Concentration in Agribusiness (p. 99)

**Master of Science**

**Majors:**

- Agriculture Biology (p. 115); (p. 120)
- Agricultural Economics (p. 91); (p. 99)
- Animal Science (p. 100); (p. 112)
- Family and Consumer Sciences (p. 121); (p. 136)
- Fish, Wildlife and Conservation Ecology; (p. 146)
- Horticulture (p. 169);
- Plant and Environmental Sciences (p. 169);
- Range Science (p. 113);
- Water Science and Management (p. 176);

## Doctoral Degrees

**Doctor of Economic Development**

Major in Economic Development (p. 100)

**Doctor of Philosophy**

**Majors in:**

- Animal Science (p. 113);
- Plant and Environmental Science (p. 169);
- Range Science (p. 114);

- Water Science and Management (p. 176)

## Undergraduate Minors

- Agricultural & Extension Education (p. 91)
- Agricultural & Natural Resource Leadership (p. 91)
- Agricultural Business Management (p. 97)
- Agronomy (p. 168)
- Child Advocacy Studies (p. 136)
- Clothing, Textiles and Fashion Merchandising (p. 136)
- Conservation Ecology (p. 145)
- Culinary Science (p. 136)
- Entomology (p. 120)
- Family and Child Science (p. 136)
- Food Studies (p. 136)
- Horse Management (p. 110)
- Horticulture (p. 168)
- Hotel, Restaurant and Tourism Management (p. 98)
- Human Animal Interaction (p. 110)
- Livestock Production (p. 111)
- Natural Resource Economics (p. 98)
- Nutrition (p. 136)
- Pest Management (p. 120)
- Plant Pathology (p. 120)
- Ranch Management (p. 111)
- Range Science (p. 111)
- Soil Science (p. 168)
- Turfgrass Science and Management (p. 169)
- Weed Science (p. 120)
- Wildlife Science (p. 146)

## Graduate Minors

- Agricultural & Extension Education (p. 91)
- Animal Science (p. 114)
- International Agricultural Development and Extension (p. 91)

## Accreditation

The two teacher education options (Agricultural Education Teaching and Advanced Technology Education) in the Department of Agricultural and Extension Education are accredited by the National Council for the Accreditation of Teacher Education. It is critical that students consult their academic advisor prior to selection of courses for the agriculture, secondary science and teaching endorsements.

## General Agriculture

### General Agriculture - Bachelor of Science in Agriculture

The general agriculture major is designed for students searching for a well-rounded education that builds on the diversity of the other degree programs in the College of Agricultural, Consumer and Environmental Sciences (ACES). The flexibility of the general agriculture degree allows students to tailor a program to fit their individual interests and career goals. Students completing the program earn a Bachelor of Science in General Agriculture. Students choose general agriculture for a variety of

reasons. Some may enter the program with a specific career goal in mind. Others may choose general agriculture to obtain a broader education that will give them more flexibility. The curriculum in General Agriculture is administered by the Department of Entomology, Plant Pathology and Weed Science.

### New Mexico and University Requirements

#### Area I. Communications

ENGL 111G	Rhetoric and Composition	4
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Select one from the following:		3
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AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
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COMM 253G	Public Speaking	
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COMM 265G	Principles of Human Communication	
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Select one from the following:		3
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ENGL 203G	Business and Professional Communication	
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ENGL 211G	Writing in the Humanities and Social Sciences	
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ENGL 218G	Technical and Scientific Communication	
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ENGL 311G	Advanced Composition	
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ENGL 318G	Advanced Technical and Professional Communication	
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#### Area II. Mathematics

Select 3 credits from the following:		3
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MATH 121G	College Algebra	
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MATH 142G	Calculus for the Biological and Management Sciences	
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MATH 190G	Trigonometry and Precalculus	
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MATH 191G	Calculus and Analytic Geometry I	
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MATH 210G	Mathematics Appreciation	
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#### Area III. Science, with Laboratory

Select 8 credits from the "General Education Courses" section of this catalog.		8
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#### Area IV. Social/ Behavioral Sciences

Select 6-9 credits from the "General Education Courses" section of this catalog.		6-9
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#### Area V. Humanities and Fine Arts

Select 6-9 credits from the "General Education Courses" section of this catalog.		6-9
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#### Viewing a Wider World

Select six 300 or 400 level credits from Viewing a Wider World courses <sup>1</sup>		6
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#### Additional College Requirements<sup>2</sup>

Select three areas of concentration from the following ACES departments: <sup>3</sup>		52
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Agricultural Economics and Agricultural Business	
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Agricultural and Extension Education	
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Animal and Range Science	
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Entomology, Plant Pathology and Weed Science	
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Family and Consumer Sciences	
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Fish, Wildlife and Conservation Ecology	
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Plant and Environmental Sciences	
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Hotel, Restaurant and Tourism Management	
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<b>Electives: to bring total to 120 credits</b>	29
<b>Total Credits</b>	120-126

- <sup>1</sup> One course must be from a college outside of the College of Agricultural, Consumer and Environmental Sciences.
- <sup>2</sup> Some ACES classes will meet general education requirements.
- <sup>3</sup> At least 18 credits must be taken from the primary department and at least 12 credits must be taken from two secondary departments. A minimum of 52 credits (20 of which need to be 300+) of the 120 required for the degree, must be completed in courses offered by the College of Agricultural, Consumer, and Environmental Sciences.

## Veterinary Medicine (Preprofessional Training Only, Non-Degree)

The Doctor of Veterinary Medicine (D.V.M.) degree is a professional degree that is not offered by any college or university in New Mexico; however, you may complete the preparatory program required for admittance to the professional colleges of veterinary medicine at New Mexico State University.

The D.V.M. degree normally requires four years of training in a professional college subsequent to completion of a preveterinary program that requires at least three years of college-level instruction. In most instances a baccalaureate degree is a distinct advantage to the applicant.

Curriculum requirements are determined by the particular school or college of veterinary medicine. The Department of Animal and Range Sciences maintains current requirements for Colorado State University, Washington State, Oregon State and Texas A&M. You should check with an advisor for specific course requirements. As a student from New Mexico, you may be eligible for financial assistance under the program of the Western Interstate Commission for Higher Education (WICHE). See the section on WICHE in the General Information chapter under Resources for Students for more information.

## Agricultural and Extension Education Undergraduate Program Information

The department offers a broad-based curriculum with majors, options and minors that prepare students for many careers as professional educators, communicators and leaders in agricultural, natural resource, technology and related disciplines. Some example occupations that the department prepares its students to enter are agriculture teacher, media specialist, technology teacher, Extension agent, NMDA or USDA professional, industry educational specialist, and development specialist. Graduates work in domestic and/or international settings.

### General Undergraduate Degree Requirements

You must meet the general education and departmental requirements for the degree and the major, option or minor chosen. You must establish a cumulative grade-point average of not less than 2.5 before you are admitted into the student teaching or other internship program. You need a minimum of 48 hours in technical agriculture for the secondary teaching certificate program in agriculture.

You may select technical courses required for completion of the majors and options from the following areas:

- agricultural economics (p. 91);

- agricultural mechanics;
- animal and range sciences (p. 100);
- entomology, plant pathology and weed science (p. 115);
- fish, wildlife and conservation ecology (p. 136);
- engineering (p. 556);
- also plant and environmental sciences (p. 147).

## Graduate Program Information

The Department of Agricultural and Extension Education requires the following items be sent directly to the department for admission:

- **Three letters of recommendation** - Applicants should request letters of recommendation from individuals who know them well enough to comment on their professional skills and abilities, and on their ability to complete graduate-level work.
- **Career statement** - The two-page letter of application should clearly identify applicant's professional and career goals as well as reasons for pursuing the degree.
- **Personal interview** - Upon receipt of all application materials, a personal interview may be required at the discretion of the Departmental Graduate Committee.

**\*Do not send the above items to the Graduate School as this will cause a delay on your admission status.**

### General Graduate Degree Requirements

The major requires courses in research methods, teaching methods and data collection and analysis; a graduate seminar; and a thesis or creative component. The department also have two 9 credit minors which are available to students completing major work in other departments.

**Thesis plan:** Requires a minimum of 30 semester credits which includes 4-6 credits of thesis. *(Both plans require a final oral examination).*

**Non-Thesis plan:** Requires 32 semester credits of course work which includes a focused creative component. *(Both plans require a final oral examination).*

Flexibility in each program allows students to pursue professional interests and to develop specialized competencies in agricultural and extension education, technology education, and in technical and scientific areas. The department delivers courses in evening, weekend and distance formats (go to <http://distance.nmsu.edu> and click on degree programs, and then Agricultural and Extension Education) to accommodate student needs. Previous experience in teaching, extension and/or other professional education positions is highly recommended to be considered for a graduate teaching assistantship.

The department offers major work for a Master of Arts in Agricultural and Extension Education. The degree can be obtained with emphasis in

- Agricultural or Technology Teacher Education,
- Extension Education,
- International Extension and Development, and
- Adult Non-formal Education.

## Degrees for the Department

Agricultural and Community Development - Bachelor of Science in Agriculture (p. 90)

Agricultural and Extension Education - Bachelor of Science in Agriculture (p. 90)

Agricultural and Extension Education - Master of Arts (p. 91)

## Minors for the Department

Agricultural and Extension Education - Undergraduate Minor (p. 91)

Agricultural and Natural Resource Leadership - Undergraduate Minor (p. 91)

Agricultural and Extension Education - Graduate Minor (p. 91)

International Agricultural Development and Extension - Graduate Minor (p. 91)

**Professor, April Ulery, Interim Department Head**

**Professors** Dormody, Hodnett, Seevers, VanLeeuwen; **Associate Professor** Rosencrans, **Assistant Professor** Easterly

*B. Chamberlin, Ph.D. (University of Virginia)-informal and non-formal learning, educational media design; T. J. Dormody, Ph.D. (Cornell)- agricultural education, leadership, and agricultural communications; R.G. (Tre) Easterly, Ph.D. (University of Florida)-agricultural education, pre-service teacher preparation, teacher professional development, J.Gleason, Ed.D. (Virginia Tech)- instructional technology, agricultural communications, and multimedia education; F. Hodnett, Ph.D. (New Mexico State)- youth development, youth leadership, youth program development; C. Rosencrans, Ph.D. (Iowa State)- agricultural mechanics, technology education and youth development; B. Seevers, Ph.D. (Ohio State)- adult and extension education; P. Skelton, Ph.D., (University of Nebraska)- youth development, sustainable agriculture and natural resource management; D. VanLeeuwen, Ph.D. (Oregon State)- statistics and research design*

## Agricultural Extension Education Courses

### **AXED 100. Introduction to Agricultural, Extension, and Technology Education**

#### **3 Credits**

Orientation to programs, philosophies, competencies and leadership skills needed by professionals in agricultural and technology education, extension education, agricultural communications, and related career opportunities in industry, governmental agencies, and international organizations.

### **AXED 105. Techniques in Agricultural Mechanization**

#### **3 Credits (2+2P)**

Development of competencies in agricultural mechanics including safety, tool identification, operation and maintenance of hand and power tools, cold metal, drafting, and plumbing procedures. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

### **AXED 200. Special Topics**

#### **1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits toward degree.

### **AXED 201G. Effective Leadership and Communication in Agricultural Organizations**

#### **3 Credits (2+2P)**

Theory and practice in leadership and communication for professionals who must work effectively in leadership and supervisory roles with people in agricultural business, industry, government agencies, and education. Course focuses on contemporary leadership theories. Oral communication skills in informative and persuasive speaking, parliamentary procedure, and for small groups are developed.

### **AXED 205. Metal Technology-Fabrication**

#### **3 Credits (2+4P)**

Processes and procedures of metal fusion, including gas and electric welding techniques and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

### **AXED 230. Early Field-Based Experience in Extension and Industry**

#### **2 Credits (2)**

First Hand view of the roles of professional educators through field experiences with Cooperative Extension or other government agencies. Includes 4 weeks of classroom instruction and 30 hours of observation in a work setting. Consent of Instructor required. Restricted to Las Cruces campus only.

### **AXED 232. Early Field-Based Experience in Agricultural and Technology Education**

#### **2 Credits**

First-hand view of the roles of professional educators through field experiences in a secondary agricultural or technology education setting. Includes 4 weeks of classroom instruction and 30 hours of observations in a classroom setting. Consent of Instructor required.

### **AXED 240. Introduction to Agricultural Communication**

#### **3 Credits**

Students will learn about the history and theories of agricultural communications, be introduced to the degree program, explore careers in the field, and examine the role of media in agricultural communications

### **AXED 300. Special Topics**

#### **1-4 Credits**

Course addresses specific subjects and issues as identified by department. Topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits may be applied to a degree.

### **AXED 303. Small Engine Technology**

#### **3 Credits (2+2P)**

Development of competencies in small gasoline engines; theory, operation, design, maintenance and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

### **AXED 331. Agricultural Structures**

#### **3 Credits (2+3P)**

Selection and use of agricultural building materials. Design, construction, and maintenance of agricultural structures. Development of competencies in carpentry, concrete, electricity, masonry, and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

**AXED 348. Advanced Technology in the Agricultural Mechanization  
3 Credits (2+3P)**

Students will construct a project in the area of agricultural mechanization under the direction of instructor. Project must be completed within a semester and of sufficient complexity for 3 credits.

**Prerequisite(s):** AXED 105 and 205 or consent of instructor.

**AXED 360. Agricultural Communications****3 Credits**

Principles and practical experience in news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities, especially as related to the fields of agriculture and family and consumer sciences.

**AXED 380. Philosophy and Methods of Contests****3 Credits**

Covers the roles that career development events (contests) play in agricultural and technology education and in extension programs. Topics include competition and cooperation, winning and losing, ethics, use of community resources, and academic and employability skills taught through contests. Coaching as a teaching method is introduced and expanded. Students will assist with the coordination of various career development events. May be repeated up to 3 credits.

**AXED 400. The Diffusion and Adoption of Agricultural Innovations****3 Credits**

Factors that influence the rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Same as AXED 500.

**AXED 415. Youth Program Development and Management****3 Credits**

Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations.

**AXED 430. Teaching Adults in Nonformal Settings****3 Credits**

The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education.

**AXED 436. Keys for Agricultural and Rural Development****3 Credits**

Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally.

**AXED 443. Curriculum Development and Assessment in Agricultural Education****3 Credits**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting.

An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers. Restricted to: AXED majors.

**Prerequisite(s):** 2.5 GPA.

**AXED 444. Planning and Methods in Nonformal Education  
3 Credits**

Identifying trends and resources of a community and planning community-based extension and nonformal education programs. Preliminary methods for teaching and evaluating nonformal education programs.

**AXED 445. Developing Excellent Programs in Career and Technical Education****3 Credits**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability for the program are discussed.

**AXED 446. Methods for Teaching Agricultural and Technology Education  
3 Credits**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Restricted to AXED Majors

**Prerequisite:** GPA of 2.5 or above.

**AXED 447. Directed Teaching in Agricultural or Technology Education  
15 Credits**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural or technology education supervising teachers. Consent of Instructor required. Restricted to: AXED majors.

**Prerequisite(s):** AXED 445, 446 and consent of instructor.

**AXED 448. Directed Teaching in Extension Education  
3-12 Credits (3-12)**

Four-to-fourteen-week, professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Consent of instructor required.

**AXED 449. Directed Field Experience in Agricultural or Technology Education****3-12 Credits (3-12)**

Four-to-fourteen-week, supervised learning experience in an approved teaching setting with application to educational, agricultural, technological, communications, public relations, or environmental practices. Consent of instructor required.

**AXED 456. Introduction to Research Methods  
3 Credits**

Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search.

**Prerequisite:** junior standing.

**AXED 460. Methods in Career and Technical Laboratory Instruction  
2 Credits**

For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors.

**AXED 466V. John Muir: Lessons in Sustainability  
3 Credits**

This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influences his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable past.

**AXED 475. Leadership On Agricultural and Natural Resource Issues  
3 Credits**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings.

**AXED 480. International Agricultural Development  
3 Credits**

Introduction to Agricultural topics (products, people, environment, culture, etc) that affect international development. Topics provide students with awareness, knowledge and understanding of teaching, research and service opportunities for those seeking experience or careers in international agricultural development. Taught with AXED 580.

**AXED 484. Methods of Teaching Biological, Earth and Physical Sciences in Agriculture  
3 Credits**

Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered focus on incorporating biological, earth and physical sciences into agricultural instruction and may include: Tissue culture, animal anatomy, hydroponics microscopy, electrophoresis, microbiology, soils and plant nutrients, water quality, water systems, entomology, integrated pest management, and renewable energy applications. Students develop their own modules and/or experiments.

**AXED 486. Effective Management of Volunteer Programs  
3 Credits**

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention.

**AXED 488. 4-H Youth Development  
1 Credit**

On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension.

**AXED 489. The FFA Organization: An Overview  
1 Credit**

Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education.

**AXED 490. Independent Study in Agricultural, Extension, or Technology Education  
1-3 Credits**

Specific subjects are agreed upon by the student and instructor. May be repeated for a maximum of 6 credits.

**Prerequisites:** junior or senior standing and consent of instructor.

**AXED 499. Undergraduate Research  
1-4 Credits**

Research experience in agricultural, extension, and technology education with applications to selected issues and problems.

**Prerequisites:** consent of instructor.

**AXED 500. The Diffusion and Adoption of Agricultural Innovations  
3 Credits**

Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 400 with differential assignments for graduate students.

**AXED 515. Youth Program Development and Management  
3 Credits**

Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Same as AXED 415 with differentiated assignments for graduate students.

**AXED 525. Graduate Teaching Methods  
3 Credits**

Examines the teaching and learning process, emphasizing the use of appropriate methods for teaching career and technical education subjects to youth or adults in formal and nonformal educational settings. Includes principles of teaching and learning styles, levels of cognition, syllabus development, lesson planning, teaching using a variety of methods, and evaluating students. For students who have no prior education in teaching methods.

**AXED 530. Teaching Adults in Nonformal Settings  
3 Credits**

The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Same as AXED 430 with differentiated assignments for graduate students.

**AXED 536. Keys for Agricultural and Rural Development  
3 Credits**

Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally.

**AXED 543. Curriculum Development and Assessment in Agricultural Education  
3 Credits**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers. Restricted to: AXED majors.

**Prerequisite(s):** 2.5 GPA.

**AXED 544. Planning and Methods in Nonformal Education****3 Credits**

Identifying trends and resources of a community and planning community-based extension and nonformal education programs. Preliminary methods for teaching and evaluating nonformal education programs. Same as AXED 444 with differentiated assignments for graduate students.

**AXED 545. Developing Excellent Programs in Career and Technical Education****3 Credits**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Same as AXED 445 with differentiated assignments for graduate students.

**AXED 546. Methods for Teaching Agricultural and Technology Education****3 Credits**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Same as AXED 446. Restricted to AXED Majors

**Prerequisites:** GPA of 3.0 or above.

**AXED 547. Directed Teaching in Agricultural or Technology Education****4-9 Credits (4-9)**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Consent of Instructor required. Restricted to: AXED majors.

**Prerequisite(s):** A teaching methods class and consent of instructor.

**AXED 548. Directed Teaching in Extension Education****4-9 Credits (4-9)**

Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Same as AXED 448 with reduced credit hours for graduate students. Restricted to majors. Main campus only.

**Prerequisite:** consent of instructor.

**AXED 549. Directed Field Experience in Agricultural or Technology Education****4-9 Credits (4+9P)**

A four-to-fourteen-week supervised learning experience in an approved teaching setting with application to educational, agricultural, technological, communications, public relations, or environmental practices. Same as AXED 449 with reduced credit hours for graduate students. Restricted to majors. Main campus only.

**Prerequisite:** consent of instructor.

**AXED 556. Research Methods****3 Credits**

Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. Same as FCSC 556.

**AXED 565. New Mexico Water Issues****3 Credits**

Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated.

**AXED 571. Data Collection and Analysis****3 Credits**

Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended.

**AXED 575. Leadership on Agricultural and Natural Resource Issues****3 Credits**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students.

**AXED 580. International Agricultural Development****3 Credits**

Introduction to agricultural topics (products, people, environment, culture, etc.) that affect international development. Topics provide students with awareness, knowledge and understanding of teaching, research, and service opportunities for those seeking experience or careers in international agricultural development and education. Taught with AXED 480.

**AXED 586. Effective Management of Volunteer Programs****3 Credits**

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. Taught with AXED 486 with differentiated assignments for graduate students.

**AXED 590. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits toward degree.

**AXED 594. Workshops in Agricultural, Extension, and Technology Education****1-3 Credits**

Workshop procedures applied to current trends in agricultural, extension, and technology education. Maximum of 7 credits toward a degree.

**AXED 595. Internship/Cooperative Experience****1-6 Credits**

Supervised professional on-the-job learning experience. Maximum of 6 credits toward a degree.

**Prerequisite:** Consent of instructor.

**AXED 598. Creative Component****1-4 Credits**

For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. Maximum of 6 credits toward a degree.

**Prerequisite:** consent of instructor.

**AXED 599. Master's Thesis****1-6 Credits**

Thesis.

**Name:** Dr. Frank Hodnett

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**Phone:** (575) 646-4511

**Website:** <http://aces.nmsu.edu/academics/axed>

## Agricultural and Community Development - Bachelor of Science in Agriculture

**Required Courses**

AXED 100	Introduction to Agricultural, Extension, and Technology Education	3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	3
AXED 360	Agricultural Communications	3
AXED 400	The Diffusion and Adoption of Agricultural Innovations	3
or AXED 436	Keys for Agricultural and Rural Development	
AXED 415	Youth Program Development and Management	3
or AXED 430	Teaching Adults in Nonformal Settings	
AXED 444	Planning and Methods in Nonformal Education	3
AXED 475	Leadership On Agricultural and Natural Resource Issues	3
Agricultural Economics (at least 12 credits)		12
Agricultural Mechanics and Technology		6
Plant and Pest Sciences (at least 13 credits)		13
Animal Science (at least 9 credits)		9
Natural Resources (at least 9 credits)		9
Internship/Emphasis Area (at least 12 credits)		12
<b>Total Credits</b>		<b>82</b>

## Agricultural and Extension Education - Bachelor of Science in Agriculture

## Concentration: Advanced Technology Education

**Required Courses**

AXED 100	Introduction to Agricultural, Extension, and Technology Education	3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	3
AXED 232	Early Field-Based Experience in Agricultural and Technology Education	2
AXED 445	Developing Excellent Programs in Career and Technical Education	3
AXED 446	Methods for Teaching Agricultural and Technology Education	3

**Technology Education**

AXED 447	Directed Teaching in Agricultural or Technology Education	15
AXED 460	Methods in Career and Technical Laboratory Instruction	2
RDG 414	Content Area Literacy	3
SPED 350	Introduction to Special Education in a Diverse Society	3

**Upper Division Technical Education**

Select at least 18 credits, which may include: 18

AXED 331	Agricultural Structures	
AXED 348	Advanced Technology in the Agricultural Mechanization	
AXED 484	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	

**E T Courses**

E T 300	Special Topics	1-3
E T 317	Advanced 3-D Modeling and Design	3
E T 365	Building Utilities	3
E T 480	Innovation and Product Development	3

**Total Credits** 65-67

## Concentration: Agricultural Communications

This degree option includes a certificate in Creative Media Technology and a minor in either Journalism and Mass Communication or Communication Studies. See your academic advisor for more information.

## Concentration: Agricultural Education Teaching

**Required Courses**

Select 28-33 credits from the following: 28-33

ACES 111	Freshman Orientation	
AXED 100	Introduction to Agricultural, Extension, and Technology Education	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
AXED 232	Early Field-Based Experience in Agricultural and Technology Education	

AXED 380	Philosophy and Methods of Contests	
AXED 445	Developing Excellent Programs in Career and Technical Education	
AXED 446	Methods for Teaching Agricultural and Technology Education	
AXED 447	Directed Teaching in Agricultural or Technology Education	
AXED 460	Methods in Career and Technical Laboratory Instruction	
AXED 484	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	
AXED 489	The FFA Organization: An Overview	
RDG 414	Content Area Literacy	
SPED 350	Introduction to Special Education in a Diverse Society	
Agricultural Economics (at least 9 credits)		9
Agricultural Mechanics (at least 12 credits)		12
Plant, Pest and Soil Sciences (at least 12 credits)		12
Select at least 12 credits from one of the following areas:		12
Animal Science		
Horticulture		
Natural Resources		
Total Credits		73-78

## Agricultural and Extension Education - Undergraduate Minor

The department offers a minor in agricultural and extension education, which may be earned by completion of 18 credits in the department. The minor must include 9 credits of upper-division courses.

## Agricultural and Natural Resource Leadership - Undergraduate Minor

The department offers a minor in agricultural and natural resource leadership, which may be earned by completing

### Required Courses

Leadership Related Courses in the Department of Agricultural and Extension Education	12
Leadership Related Course from Outside the Department of Agricultural and Extension Education	3
Agricultural or Natural Resource Policy Course	3
Total Credits	18

The minor must include 9 credits of upper division courses.

## Agricultural and Extension Education - Master of Arts

To be admitted to the graduate program in Agricultural and Extension Education, the student must have a baccalaureate degree from an accredited college or university with an academic record that clearly demonstrates an ability to pursue graduate studies in this field. As a general rule, applicants will not be admitted to the program unless they have a 3.0 (out of a possible 4.0) cumulative point-hour ratio for all

previous academic work, though the records of potential students will not be examined strictly from an academic perspective. Students with a GPA of 2.5-2.99 may be considered for admission on a provisional status.

The AXED Graduate Studies Committee reviews each application and decides whom to admit into the master's program. Master's degree students are admitted each semester.

The committee will consider only those applicants from whom all of the admission materials have been received. It is the applicant's responsibility to ensure that all materials are received to meet graduate school and departmental requirements.

## Agricultural and Extension Education - Graduate Minor

A graduate student who wishes to minor in AXED, while majoring in another academic program, should select an advisor from the AXED Graduate Faculty. A student minoring in AXED must complete at least nine credit hours of approved courses in the AXED department. A copy of the minor program must be approved by the AXED department head. Contact an advisor in AXED.

## International Agricultural Development and Extension - Graduate Minor

A student who wishes to have a minor in Agricultural Development and Extension must complete nine credits of approved courses. Two courses are required for the minor: AXED 500-Diffusion and Adoption of Agricultural Innovations and AXED 580-International Agricultural Development. A third three credit course may be selected from several approved electives.

## Agricultural Economics and Agricultural Business

### Undergraduate Program Information

A total of 120 credits are required for graduation, specific courses meeting these and the university general education requirements are included for each major. At least 48 credits, of the total 120, must be at the 300+ level (upper division). You will develop a course schedule for specific semesters with the help of your academic advisor, located in the Center for Academic Advising and Student Support- Gacia Center.

### Graduate Program Information

The Department of Agricultural Economics and Agricultural Business cooperates with the Department of Economics, Applied Statistics, and International Business and the College of Business to offer graduate programs in agricultural economics and economics and a Master of Business Administration with specialization in Agribusiness. The programs are jointly administered by faculty from the two colleges. Graduate degrees include

- a Master of Science in agricultural economics,
- a Master of Agriculture with an agribusiness emphasis, and
- an MBA degree with specialization in agribusiness.

The objectives of the three programs differ in emphasis. The two departments also offer a doctoral program, Doctor of Economic Development.

- Master of Agriculture (MAG-AB) with Specialization in Agribusiness provides students with backgrounds or interests in agriculture with graduate-level training in agribusiness and applied economics. It is a degree alternative for individuals holding undergraduate degrees in various agricultural and food science fields.
- Master of Business Administration with Specialization in Agribusiness (MBA-AB) prepares students for business and public sector careers in agriculture and the food and fiber industry. Graduates from this program are knowledgeable about U.S. and international food and fiber sectors and hold an AACSB International accredited MBA degree.
- Master of Science (MS) in Agricultural Economics program provides rigorous training in economic theory, applied economic analysis and quantitative methods and is designed to prepare students for professional careers in business, government, research, and for continued education in pursuit of a Ph.D.
- Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

All students in these programs must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. To transfer between the program options requires a change of major form be submitted through the Graduate School and approved by the program to which the application is made.

Teaching and research assistantships are available to qualified applicants on a competitive basis. It is not necessary to have a degree in economics or agricultural economics to enter the graduate program or to qualify for a teaching or research assistantships. An application and three letters of reference are required to be considered for any available assistantships. These forms can be obtained from the department.

## Degrees for the Department

Agricultural Economics and Business - Bachelor of Science in Agriculture (p. 96)

Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 97)

Agriculture - Master of Agriculture (p. 98)

Agriculture - Master of Business Administration (p. 99)

Agricultural Economics - Master of Science (p. 99)

Economic Development - Doctor of Economic Development (p. 100)

## Minors for the Department

Agricultural Business Management- Undergraduate Minor (p. 97)

Natural Resource Economics- Undergraduate Minor (p. 98)

**Professor, Jay Lillywhite, Department Head**

**Professors** Gorman, Gutierrez, Hawkes, Hurd, Libbin, Lillywhite, Ward

**Associate Professors** Acharya, Patrick;

**Assistant Professors** Ramsey

**College Professors** Bullock; Townsend

**College Assistant Professor** Robinson

### Department of Agricultural Economics and Agricultural Business:

*J. Lillywhite, Department Head, Ph.D. (Purdue)– agribusiness management and marketing; R.N. Acharya, Ph.D. (Auburn)– food safety, logistics management, technology adoption, and marketing; T. L. Crawford, Ph.D. (Emeritus) Cornell)– marketing, policy and pricing, quantitative methods, trade; J.M. Fowler, Ph.D. (Emeritus) (Iowa State)– forestry and range economics; W. D. Gorman, Ph.D. (Emeritus) (Oregon State)– agricultural business management, international marketing; P. Gutierrez, Ph.D. (Oklahoma State)– extension, ranch economics, economic development; J. Hawkes, Ph.D. (New Mexico State)– extension, range management; B. H. Hurd, Ph.D. (California-Davis)– water and natural resource economics; J. D. Libbin, Ph.D. (Iowa State)– farm management, production economics; M. Patrick, Ph.D. (Michigan State University)– Economic Development; S. Ramsey, Ph.D. (Kansas State)- agricultural economics, production, natural resources; R. Skaggs, Ph.D. (Emeritus) (Utah State)– agriculture and natural resource policy; F. A. Ward, Ph.D. (Colorado State)– resource economics, welfare economics*

### Department of Economics, Applied Statistics and International Business:

*R. Adkisson, Department Head, Ph.D., (Nebraska)– international economics, public finance, institutional economics; B. Bai, MS (New Mexico State University)– applied statistics; L. Blank, Ph.D. (University of Tennessee, Knoxville)– microeconomic theory, managerial economics and regulatory economics; K. Brook, Ph.D. (Texas-Austin)– macroeconomic theory, monetary policy; D. L. Daniel, Ph.D. (Southern Methodist)– nonparametrics; C. M. Downes, Ph.D. (University of New Mexico)– environmental/resource economics, development, international business; C. Enomoto, Ph.D. (Texas A&M)– econometrics, economic theory; C. A. Erickson, Ph.D. (Arizona State)– monetary theory, macroeconomics; C. Gard, Ph.D. (University of Washington)– biostatistics; D. A. Gegax, Ph.D. (Wyoming)– public utility economics, industrial organization; K. R. Geisler, Ph.D. (Nevada)– regional, applied micro, environmental; W. R. Gould, Ph.D. (North Carolina State)– biological sampling, wildlife and fisheries estimation; Y. L. Lee, Ph.D. (Southern Illinois-Carbondale)– international finance, international trade, international system, economic developments; R. McFerrin, Ph.D. (Texas A & M University)– micro theory, principles and American economic history; J. T. Peach, Ph.D. (Texas-Austin)– quantitative economics, border studies, economic development; C. Ricketts, Ph.D. (Mississippi State)– labor, health, development; R. L. Steiner, Ph.D. (Oklahoma State)– likelihood methods, discrete distributions; D. Van Leeuwen, Ph.D. (Oregon State)– statistics; B. Widner, Ph.D. (Colorado State)– urban/regional, public finance, development; D. L. Clason, (Emeritus) Ph.D. (Kansas State)– linear models, government statistics; M. Ellis (Emeritus), Ph.D. (California-Riverside)– comparative economic systems, medical economics; B. N. Matta, Ph.D. (Emeritus) (Texas-Austin)– labor economics, managerial economics; J. T. McGuckin, (Emeritus) Ph.D. (Wisconsin-Madison)– production economics, resource economics and policy; A. V. Popp, Ph.D. (Emeritus) (Northern Illinois)– public finance; D. B. Smith (Emeritus), Ph.D. (Nebraska); E. S. Willman, (Emeritus) Ph.D. (Indiana)– monetary policy, macroeconomic theory*

## Agricultural Economics (Undergraduate) Courses

### AG E 100. Introductory to Food and Agribusiness Management

#### 3 Credits

Orientation to agricultural supply businesses, farm and ranch production, food markets, food processing and distribution, and food consumption. Microeconomic principles for managers. May be repeated up to 3 credits.

### AG E 101. Careers in Food and Agribusiness

#### 1 Credit

Orientation to agribusiness management. Students will learn about agricultural production and marketing in New Mexico, the United States, and the world. Students will be introduced to faculty and staff within the department, learn about career opportunities available to AEAB graduates, and develop a greater appreciation of agricultural management issues. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** Freshman status only or obtain consent of instructor.

### AG E 200. Special Topics

#### 1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. Consent of instructor required.

### AG E 210G. Survey of Food and Agricultural Issues

#### 3 Credits

Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with: FSTE 210G.

### AG E 236. Principles of Food and Agribusiness Management

#### 3 Credits

Description and application of management and financial principles, market planning, and organization theory in small business situations. May be repeated up to 3 credits.

### AG E 250. Technology and Communication for Business Management

#### 3 Credits (2+2P)

Understanding and improving skills for data analysis, information management and communication is the focus of this course. Drawing examples from a variety of management, business, technological and research situations, students discover the versatility and variety of uses of computer applications such as spreadsheet, database, presentation and document software. Emphasizing a 'hands-on' approach students learn the foundations of these tools and their use.

### AG E 260. Introduction to Food and Agribusiness Accounting

#### 3 Credits

Purpose and methods of keeping and analyzing farm and ranch records. Net worth and income statements, efficiency measures, analysis of the business, and tax computations. May be repeated up to 3 credits.

### AG E 300. Internship

#### 1-4 Credits (1-4)

Professional work experience under the supervision of a faculty member. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of instructor.

### AG E 305. Marketing and Food Agricultural Products

#### 3 Credits

Description of agricultural processes and functions; food production and consumption patterns; agricultural product prices; nature of competition in agricultural product markets; commodity markets. May be repeated up to 3 credits. Crosslisted with: MKTG 305.

**Prerequisite(s):** ECON 201G or ECON 252G.

### AG E 311. Financial Futures Markets

#### 3 Credits

Emphasis on financial instruments, currencies, and stock index futures. Principles of hedging, arbitrage, speculation, technical and fundamental price analysis, and trading strategies. Simulated computer trading game. Same as AEEC/FIN 511 with additional coursework required at the graduate level. Cannot receive credit for both AG E/FIN 311 and AEEC/FIN 511. Same as FIN 311.

### AG E 313. Food and Agricultural Sales

#### 3 Credits

Techniques of salesmanship including application of sales techniques. Identification and classification of buyer type and different approaches to sales based on client base. Improving oral communication skills through individual and/or group sales presentations. May be repeated up to 3 credits.

**Prerequisite(s):** Junior or above standing.

### AG E 314. Agricultural and Natural Resource Law

#### 3 Credits

Relationship of common-law principles, statutory law and regulatory law to problems involving agriculture with an emphasis on New Mexico issues. Legal problems relevant to agribusiness, torts, fencing laws, liability for agricultural pollution, irrigation water rights, corporations and partnerships, land tenure, farm and ranch tenancy, agricultural labor, farm and ranch management and taxation. May be repeated up to 3 credits.

### AG E 315V. World Agriculture and Food Problems

#### 3 Credits

Survey of food and agricultural issues in the U.S. and other countries. Covers: role of agriculture in economic development; trade in food and agricultural products; global food production, consumption, and marketing patterns; economics of technical change and food assistance; agriculture and the environment. Same as GEOG 315V.

### AG E 325. Food and Agribusiness Finance and Planning

#### 3 Credits

Understanding, using, and constructing financial statements for agribusiness analysis. Learn how to produce integrated pro forma financial statements first on paper and then on a spreadsheet. Prepare and link revenue, cost, and financing input assumptions formulas to the financial outcomes on the spreadsheet. May be repeated up to 3 credits. Crosslisted with: ANSC 325.

**Prerequisite(s):** AG E 250 or equivalent experience using spreadsheets.

### AG E 337V. Natural Resource Economics

#### 3 Credits

Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as ECON 337V.

**Prerequisite:** ECON 201G or ECON 252G.

**AG E 340. Economics of Food and Agricultural Markets****3 Credits**

Focuses on the analysis of supply and demand characteristics of commodities with particular attention to agricultural products. Pays special attention to empirical analysis. Includes institutional aspects of pricing, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 252G, MATH 142G, and A ST 311 or A ST/STAT 251G.

**AG E 342. Economic Analysis of Food and Agribusiness****3 Credits**

A discussion and application of economic, managerial, and financial considerations in agricultural business. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 251G, ECON 252G.

**AG E 384V. Water Resource Economics****3 Credits**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as ECON 384V.

**Prerequisite:** AG E 100 or ECON 252G.

**AG E 385. Applied Production Economics****3 Credits**

Analysis of economic principles of agricultural production and planning, emphasizing marginal principles. Practical application in budgeting and analyzing profit maximizing agricultural-production strategies. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 252G, MATH 142G, and A ST 311 or A ST/STAT 251G.

**AG E 400. Seminar****1 Credit**

Current topics and cases in the agribusiness literature stressing rigorous qualitative analysis of current problems and policy issues. Consent of Instructor required. Restricted to: AEAB; NREP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Senior standing.

**AG E 406. The Economics of Sports****3 Credits**

Applying the tools of economic analysis to a particular industry and gaining an in-depth knowledge of the interaction of professional sports teams and leagues with the economy and society. Same as ECON 406.

**AG E 420. Special Problems****1-3 Credits**

Special problems in agricultural economics or agricultural business of particular interest to the individual student. Maximum of 3 credits per semester. No more than 6 credits toward degree. Consent of instructor required.

**AG E 425. Food and Agribusiness Financial Management****3 Credits**

Description and application of techniques and principles of financial management to problem situations faced by agricultural businesses, including financial statement development and analysis, capital budgeting, sources and costs of capital. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 252G and ACCT 221.

**AG E 445V. Agricultural Policy****3 Credits**

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts.

**Prerequisites:** ECON 251G and ECON 252G.

**AG E 450. Spreadsheet Applications in Food and Agriculture****3 Credits (2+2P)**

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural application.

Same as AEEC 550 with additional work for graduate credit. Cannot receive credit for both AG E 450 and AEEC 550. May be repeated up to 3 credits.

**Prerequisite(s):** AG E 250 or consent of instructor.

**AG E 451. Food and Agribusiness Market Assessment and Research****3 Credits**

Applications course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: MKTG 451.

**Prerequisite(s):** AG E 305 or MKTG 305 or consent of instructor.

**AG E 452. Food and Agribusiness Marketing Plan Development****3 Credits**

This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions. May be repeated up to 3 credits.

**AG E 456. Case Studies in Food and Agribusiness Management****3 Credits**

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach. May be repeated up to 3 credits.

**Prerequisite(s):** Senior standing.

**AG E 458. Economics of Making and Marketing Wine****3 Credits**

Economics of making and marketing wine for small commercial wineries and amateurs. The class starts with selecting, crushing, and fermenting grapes and all the steps required through bottling the wine. Students must be 21 to enroll in the class. Consent of instructor required.

**AG E 470. Real Estate Appraisal****3 Credits (2+2P)**

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with: FIN 470

**Prerequisite(s):** Junior or above standing.

**AG E 499. Senior Thesis****3 Credits**

Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. Restricted to AEAB majors.

**Prerequisites:** consent of department head and have senior standing.

## Agricultural Economics (Graduate) Courses

**AEEC 501. Microeconomic Theory****3 Credits**

A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability.

**Prerequisite(s):** ECON 371 and ECON 457, or consent of instructor.

**AEEC 502. Macroeconomic Theory****3 Credits**

Contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy.

**AEEC 511. Advanced Futures and Options Markets****3 Credits**

Advanced hedging and speculating strategies using futures and options contracts. Coverage includes interest rates, stock indexes, metals, currencies, livestock, and grains. Concepts of price analysis (technical and fundamental) and basis analysis; technical paper is required. Same as AG E/FIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AG E/FIN 311 and AEEC/FIN 311.

Crosslisted with: FIN 511.

**AEEC 520. International Agricultural Trade Theory and Policy****3 Credits**

Review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives.

**Prerequisite:** ECON 371.

**AEEC 522. Public Sector Economics I****3 Credits**

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as GOVT 522.

**AEEC 523. Public Sector Economics II****3 Credits**

A continuation of AEEC 522. Concentrates on the economic effects of taxation. Same as GOVT 523.

**AEEC 526. Global Food Supply Chain Management****3 Credits**

This course aims to provide students a basic understanding of supply chain management issues, and encourages them to analyze problems from a systems perspective, and introduce them to a number of decision tools that are currently being used by the industry such as process analysis, product design, waiting line management, quality control, just-in-time, and inventory management.

**AEEC 528. Economic Development****3 Credits**

A graduate-level exposition of microeconomic and macroeconomic theory of why and how nations allocate resources to grow and develop. Strong emphasis is given to understanding the economic problems facing developing nations.

**AEEC 540. Econometrics I****3 Credits**

An integration of quantitative and statistical techniques for research and management in economics and business.

**Prerequisite(s):** ECON 457 and ECON 405 or A ST 505.

**AEEC 545. Advanced Agricultural Policy****3 Credits**

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AG E 445V with additional work required at the graduate level. Cannot receive credit for both AG E 445V and AEEC 545.

**Prerequisite:** consent of instructor.

**AEEC 550. Advanced Microcomputer Applications in Agriculture****3 Credits (2+2P)**

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Taught with AG E 450 with additional coursework required at the graduate level. Cannot receive credit for both AG E 450 and AEEC 550.

**Prerequisite(s):** AG E 250G or consent of instructor.

**AEEC 551. Advanced Agribusiness Marketing****3 Credits**

Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with emphasis on strategic marketing issues changing trade policies, and global competitiveness.

**Prerequisite:** consent of instructor.

**AEEC 556. Advanced Agribusiness Management****3 Credits**

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach.

**AEEC 575. Economics of Water Resource Management and Policy****3 Credits**

Focuses on issues, approaches and methods used in the assessment of water resource management and policy problems. Extends and further develops student understanding and comprehension of specific economic concepts and methods that are useful in the assessment and management of water resources, including cost-benefit analysis, welfare economics, non-market valuation, watershed management, and consideration of equity and ethical concerns. Students will develop critical reasoning, communication and analytic skills through active class discussions and assignments that emphasize both quantitative and written products.

**AEEC 585. Production Economics****3 Credits**

Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 142G, ECON 312, and ECON 457.

**AEEC 590. Special Topics****3 Credits**

Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.

**Prerequisite:** consent of instructor.

**AEEC 593. Internship****1-6 Credits**

Supervised professional on-the-job training experience in policy analysis.

**AEEC 594. Internship****1-6 Credits**

One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.

**AEEC 595. Internship****3 Credits**

Supervised professional on-the-job learning experience.

**Prerequisite(s):** Consent of instructor.

**AEEC 596. Individual Study****1-3 Credits**

Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.

**Prerequisite:** consent of instructor.

**AEEC 597. Non-Thesis Research Project****1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree.

**AEEC 598. Creative Component Project****3-6 Credits (3-6)**

Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree.

Consent of instructor required. Restricted to AEEC majors.

**Prerequisite(s):** Consent of Instructor.

**AEEC 599. Master's Thesis****15 Credits**

Thesis.

**Name:** Dr. Jay Lillywhite

**Office Location:** GT Room 387

**Phone:** (575) 646-3215

**Website:** <http://www.aeab.nmsu.edu>

## Agricultural Economics and Business - Bachelor of Science in Agriculture

**General and Departmental Requirements**

ENGL 111G	Rhetoric and Composition	4
MATH 142G	Calculus for the Biological and Management Sciences	3
General Education Science with Lab		8
Social/Behavior Sciences		6-9
Humanities and Fine Arts		6-9
Viewing a Wider World		6
Select one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	

AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
HON 265G	Principles of Human Communication Honors	
Select one from the following:		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
<b>Quantitative</b>		
MATH 120	Intermediate Algebra	3
MATH 121G	College Algebra	3
AG E 250	Technology and Communication for Business Management	3
AG E 342	Economic Analysis of Food and Agribusiness	3
AG E 450	Spreadsheet Applications in Food and Agriculture	3
A ST 311	Statistical Applications	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
<b>General Business</b>		
ACCT 221	Principles of Accounting I (Financial)	3
ACCT 222	Principles of Accounting II (Managerial)	3
BLAW 316	Legal Environment of Business	3
FIN 341	Financial Analysis and Markets	3
Select one from the following MGT 300+:		3
MGT 309	Human Behavior in Organizations	
MGT 332	Human Resources Management	
MGT 361	Small Business Management	
<b>Economic Theory</b>		
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
Select one from the following:		3
AG E 340	Economics of Food and Agricultural Markets	
ECON 312	Intermediate Microeconomic Theory	
Select one from the following:		3
ECON 304	Money and Banking	
ECON 311	Intermediate Macroeconomic Theory	
<b>Applied Economics/Business</b>		
ACES 111	Freshman Orientation	1
ACES 121	Financial Fitness for College Students	1
AG E 100	Introductory to Food and Agribusiness Management	3
AG E 101	Careers in Food and Agribusiness	1
AG E 236	Principles of Food and Agribusiness Management	3
AG E/MKTG 305	Marketing and Food Agricultural Products	3
AG E 385	Applied Production Economics	3

AG E 400	Seminar	1
AG E 425	Food and Agribusiness Financial Management	3
AG E 445V	Agricultural Policy	3
AG E 456	Case Studies in Food and Agribusiness Management	3
<b>Required Specialty Area</b>		
Select and Complete 2 required courses from 1 Specialty Area:		6
<i>Natural Resources</i>		
AG E 314	Agricultural and Natural Resource Law	
AG E/ECON 337V	Natural Resource Economics	
AG E/ECON 384V	Water Resource Economics	
<i>Finance</i>		
AG E/FIN 311	Financial Futures Markets	
AG E/ANSC 325	Food and Agribusiness Finance and Planning	
AG E/FIN 470	Real Estate Appraisal	
<i>Marketing</i>		
AG E 313	Food and Agricultural Sales	
AG E/MKTG 451	Food and Agribusiness Market Assessment and Research	
Total Credits		115-121

## Natural Resource Economics and Policy - Bachelor of Science in Agriculture

### General and Departmental Requirements

ENGL 111G	Rhetoric and Composition	4
Select one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
Select one from the following:		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
MATH 142G	Calculus for the Biological and Management Sciences	3
General Education Science with Lab		8
Social/Behavior Sciences		6-9
Humanities and Fine Arts		6-9
Viewing a Wider World		6
<b>Applied Economics Core</b>		
ACES 111	Freshman Orientation	1
ACES 121	Financial Fitness for College Students	1

AG E/ECON 337V	Natural Resource Economics	3
AG E/ECON 384V	Water Resource Economics	3
AG E 385	Applied Production Economics	3
AG E 400	Seminar	1
AG E 450	Spreadsheet Applications in Food and Agriculture	3
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
<b>Science, Policy and Ethics</b>		
AG E 445V	Agricultural Policy	3
AG E 314	Agricultural and Natural Resource Law	3
or BLAW 316	Legal Environment of Business	
ECON 300+		3
FWCE 110G	Introduction to Natural Resources Management	4
FWCE 255	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
GEOG 281	Map Use: Reading, Analysis and Interpretation	3
or FWCE 450	Special Topics	
GOVT 330	Introduction to Public Administration	3
RGSC 294	Rangeland Resource Management	3
PHIL 300+		3
<b>Quantitative Skills</b>		
MATH 120	Intermediate Algebra	3
MATH 121G	College Algebra	3
A ST 311	Statistical Applications	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
AG E 250	Technology and Communication for Business Management	3
Electives: to bring the total to 120		11
Total Credits		120-126

## Agricultural Business Management-Undergraduate Minor

The minor in Agricultural Business Management (ABM) consists of 18 or more credit hours of approved course work from the list below. All courses must be completed with grades of "C" or better. Once courses are completed or show "IP" status, students pursuing the ABM minor need to log in to their mynmsu and print out the STAR Audit for the minor and obtain departmental approval. The course requirements for the ABM minor are as follows:

### Quantitative/Information - 6 credits

AG E 250	Technology and Communication for Business Management	3
A ST/STAT 251G	Statistics for Business and the Behavioral Sciences	3
or A ST 311	Statistical Applications	
<b>Agricultural Economics, Law and Policy - 6 credits</b>		
ECON 252G	Principles of Microeconomics	3

<i>Choose 1 from the following:</i>		3
AG E 314	Agricultural and Natural Resource Law	
AG E 445V	Agricultural Policy	
<b>Agribusiness Management - 6 credits</b>		
AG E 236	Principles of Food and Agribusiness Management	3
<i>Choose 1 from the following - 3 credits</i>		3
AG E 260	Introduction to Food and Agribusiness Accounting	
AG E/MKTG 305	Marketing and Food Agricultural Products	
AG E/FIN 311	Financial Futures Markets	
AG E 313	Food and Agricultural Sales	
AG E/ANSC 325	Food and Agribusiness Finance and Planning	
AG E/ECON 337V	Natural Resource Economics	
AG E 342	Economic Analysis of Food and Agribusiness	
AG E/ECON 384V	Water Resource Economics	
AG E 456	Case Studies in Food and Agribusiness Management	
AG E/FIN 470	Real Estate Appraisal	
<b>Total Credits</b>		<b>18</b>

## Natural Resource Economics - Undergraduate Minor

The minor in Natural Resource Economics (NRE) consists of 18 or more credit hours of approved course work of which at least 9 hours must be numbered 300 or above and completed with grades of "C" or better. Once courses are completed or show "IP" status in the audit, students pursuing the NRE minor need to log in to their mynmsu and print out the STAR Audit and obtain departmental approval. The course requirements for the NRE minor are as follows:

### Required Courses - 6 credits

ECON 252G	Principles of Microeconomics	3
<i>Select 1 course from the following:</i>		3
AG E/ECON 337V	Natural Resource Economics	
AG E/ECON 384V	Water Resource Economics	
<i>Select 2 courses from the following - 6 credits</i>		6
FWCE 255	Principles of Fish and Wildlife Management	
AG E 445V	Agricultural Policy	
GOVT 330	Introduction to Public Administration	
<i>Select 2 courses from the following - 6 credits</i>		6
FWCE 110G	Introduction to Natural Resources Management	
FWCE 301	Wildlife Ecology	
GEOG 281	Map Use: Reading, Analysis and Interpretation	
RGSC 294	Rangeland Resource Management	
PHIL 300+		
<b>Total Credits</b>		<b>18</b>

## Agriculture - Master of Agriculture Concentration: Agribusiness

Candidates for the Master of Agriculture (MAG) with concentration in Agribusiness must successfully complete a minimum of 33 graduate credits. Students entering the Master of Agriculture program are required to have completed:

- intermediate microeconomics and intermediate macroeconomics,
- a college-level calculus class, and
- a course in statistics that included linear regression analysis.

All prerequisite courses must be completed with a B grade or better. AEEC 545 Advanced Agricultural Policy must be taken in the graduate program if an agricultural policy course was not taken as an undergraduate. Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Prospective graduate students must have at least a 3.0 undergraduate GPA. Students with a GPA less than 3.25 must complete the GRE or GMAT exam.

All students in the MAG program must successfully complete the following:

### Core Courses

AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3
FIN 503	Financial Management	3
ACCT 503	Accounting for Managers	3

### Additional Requirements

<i>AEAB Block (6 hrs)</i> <sup>1</sup>		6
AEEC/FIN 511	Advanced Futures and Options Markets	
AEEC 520	International Agricultural Trade Theory and Policy	
AEEC 526	Global Food Supply Chain Management	
AEEC 540	Econometrics I	
AEEC 550	Advanced Microcomputer Applications in Agriculture	
AEEC 575	Economics of Water Resource Management and Policy	
AEEC 585	Production Economics	
AEEC 545	Advanced Agricultural Policy <sup>2</sup>	
<b>Internship, Creative Component, or Thesis (3-6 hrs)</b> <sup>3</sup>		3-6
AEEC 595	Internship	
AEEC 598	Creative Component Project	
AEEC 599	Master's Thesis	

<b>Electives (~9-12)</b>		<b>12</b>
<b>Total Credits</b>		<b>33-36</b>

<sup>1</sup> Some courses in this degree are core requirements for the MBA and have limitations for participation by non-MBA students. MAGRI students cannot take B A 590 and MGT 591. Only 9 hours are allowed for MAGRI students from: ACCT 503, B A 590, BLAW 502, ECON 503, FIN 503, MGT 502, MGT 503, MGT 512 or MKTG 503 - two of which are core requirements, leaving 1 choice from this group.

<sup>2</sup> AEEC 545 must be taken as part of this AEAB Block if not previously completed as an undergraduate under AG E 445V.

<sup>3</sup> Students can take 2 additional courses with advisor and graduate chairman approval in lieu of AEEC 595 Internship, AEEC 598 Creative Component Project, or AEEC 599 Master's Thesis.

A thesis (AEEC 599 Master's Thesis, 4-6 credits) is not required but can substitute for the internship or individual investigation. Individual study (AEEC 596 Individual Study) is limited to 3 credits. An oral defense must be scheduled and completed as prescribed by the Graduate School. The defense must be preceded by a public seminar to present major findings, experiences, and contributions of the individual investigation, internship, and/or thesis research to faculty, fellow students, and the interested public.

## Agriculture - Master of Business Administration

### Concentration: Agribusiness

Candidates for the Master of Business Administration with concentration in Agribusiness (MBA-AB) must successfully complete a minimum of 36 graduate credit hours. Admission to the MBA-AB program is through the College of Business. The program includes numerous prerequisites in economics, accounting, and business as defined in the Business Administration and Economics section of this catalog. AEEC 545 Advanced Agricultural Policy must be taken in the MBA-Agribusiness program if an agricultural policy course was not taken at the undergraduate level. A written paper and presentation following the guidelines described for B A 590 Professional Paper/Presentation is required. MBA-AB students can take the required minimum 4 thesis credit hours to substitute for B A 590 Professional Paper/Presentation. If a thesis (AEEC 599 Master's Thesis) is written in-lieu of taking B A 590 Professional Paper/Presentation, an examining committee and thesis defense must be organized similar to that of the MS degree program. For more information about the requirements for the MBA specialization refer to the MBA section (p. 436) of this catalog.

#### Core (21 hs)

ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
B A 590	Professional Paper/Presentation <sup>1</sup>	3
BLAW 502	Legal Environment of Business	3
FIN 503	Financial Management	3
MGT 503	Organizational Behavior and Management Processes	3
MGT 590	Strategic Management	3

#### AEAB Block Requirements (15 hrs) <sup>2</sup>

AEEC/FIN 511	Advanced Futures and Options Markets	3
AEEC 520	International Agricultural Trade Theory and Policy	3
AEEC 526	Global Food Supply Chain Management	3
AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3

Total Credits 36

<sup>1</sup> MBA-Agribusiness majors, with advisor approval, may take the required minimum 4 thesis hours (maximum of 6 hrs) in lieu of B A 590 Professional Paper/Presentation

<sup>2</sup> AEEC 545 must be taken as part of this AEAB Block if not previously completed as an undergraduate under AG E 445V.

## Agricultural Economics - Master of Science

Students entering the MS program are required to have completed

- intermediate microeconomics and intermediate macroeconomics (completed with a B grade or better),
- a college-level calculus class, and
- a course in statistics that included linear regression analysis.

Students that have not completed these courses may be admitted with the requirement that they take them as deficiencies at the beginning of their graduate program. Prospective graduate students must have at least a 3.0 undergraduate GPA. Students with a GPA less than 3.25 must complete the GRE or the GMAT exam.

Completion of the Master of Science degree in agricultural economics requires completion of a minimum of 33 graduate credit hours. Twenty-one of the credits must have one of the following three prefixes: AEEC, ECON, or ECDV. Twenty-four of the credits must be associated with course numbers greater than 500. All students in the MS program must successfully complete the following core courses:

#### M.S. CORE (16-18 hrs)

AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
AEEC 585	Production Economics	3
AEEC 599	Master's Thesis <sup>1</sup>	4
Total Credits		16

#### Choose 3 Classes from AEAB Block (9 hrs) <sup>2</sup>

AEEC/FIN 511	Advanced Futures and Options Markets	3
AEEC 520	International Agricultural Trade Theory and Policy	3
AEEC 526	Global Food Supply Chain Management	3
AEEC 550	Advanced Microcomputer Applications in Agriculture	3
AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3
AEEC 545	Advanced Agricultural Policy <sup>2</sup>	3
AEEC 575	Economics of Water Resource Management and Policy	3
AEEC 590	Special Topics	3
AEEC 596	Individual Study	3

**Additional Graduate Courses (~6 hs) <sup>3</sup>** 6

Total Credits 15

<sup>1</sup> AEEC 599 minimum hours are 4 with maximum of 6 toward the degree

<sup>2</sup> AEEC 545 must be taken as part of this AEAB Block if not previously completed as an undergraduate under AG E 445V.

<sup>3</sup> One of these two choices may include three (3) additional hours of AECC 596. Or student may select a justifiable minor (9+ hours) per Graduate School policy plus 2 additional courses from the AEAB Block.

MS students are generally required to write a thesis (AECC 599 Master's Thesis (4-6 credits). Non-thesis options that include a non-thesis research project (AECC 597 Non-Thesis Research Project, 3 credits) or an internship (AECC 595 Internship, 3 credits) must have approval from the student's committee and the graduate chairman. Students pursuing the MS degree may not complete the graduate program with more than one C grade in the core courses. If a student receives C grades in two of these core classes one of the classes must be repeated with a grade of at least B. In addition to core courses, nine additional credits must be completed from an agricultural economics and agricultural business (AEAB) course block. AECC 545 Advanced Agricultural Policy must be taken in the graduate program if an agricultural policy course was not taken as an undergraduate. Individual study (AECC 596 Individual Study) is limited to 6 credits hours. Electives and up to 3 credits from the AEAB course block can be used to pursue a minor. An oral defense is required of all master's candidates and will be scheduled and completed according to the guidelines of the Graduate School. The oral defense must be preceded by an open seminar to present major research findings to faculty, fellow students and the interested public.

## Economic Development - Doctor of Economic Development

The Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

Candidates for the DED enter the program with the equivalent of a master's degree. DED students must successfully complete approximately 60 graduate credits beyond the hours required for entry. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. DED minimum admission requirements include:

1. related master's degree or equivalent coursework;
2. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
3. one course in college-level calculus with a minimum grade of B; and
4. one course in statistics, including simple regression with a minimum grade of B.

Additionally, students who have not completed graduate level courses in microeconomic theory, macroeconomic theory, and econometrics with grades of B or better will be required to successfully complete these courses early in the DED program.

All students in the DED program must successfully complete the following:

### Core Courses

AECC 501	Microeconomic Theory	3
AECC 502	Macroeconomic Theory	3
AECC 540	Econometrics I	3
ECDV 550	Introduction to Local and Regional Development	3

ECDV 651	Economic Development Theory	3
ECDV 661	Regional Economic Modeling I	3
ECDV 662	Regional Economic Modeling II	3
ECDV 664	Population Economics	3
ECDV 668	Economic Development Finance	3
ECDV 671	Sustainable Economic Development	3
ECDV 692	Seminar in Economic Development (taken twice)	6
ECDV 681	Urban Economic Development	3
ECDV 682	Rural Development	3
ECDV 683	Seminar in National Economic Development	3
Specialty Area		6
Internship and Final Project (12-15 hrs)		12-15
Elective credits to fulfill the 60+ hour requirement		3
Total Credits		66-69

NOTE: Doctor of Economic Development (DED) students who enter the DED program with a master's degree may, upon completion of all requirements for the MA in Economics, apply for the MA in Economics degree and count courses that overlap with the DED requirements toward the DED. Students must apply separately for the MA in Economics program and the master's degree must be conferred before the DED.

Comprehensive and oral exams will be given and will determine eligibility to continue in the program and/or to graduate.

Teaching and research assistantships are available to qualified applicants, however, admission to the program does not imply or guarantee funding.

Detailed and updated information is available at <https://business.nmsu.edu/academics/graduate-programs/ded/>.

## Animal and Range Sciences Undergraduate Program Information

The Department of Animal and Range Sciences provides opportunities for you to follow a variety of interests in modern scientific agriculture. The animal science curriculum provides a background for many phases of the food animal industry, from farm animal production on rangelands to management positions in the food processing industry to highly technical careers in research and companion animal management. The range science curriculum provides you with knowledge and skills necessary to sustainably manage rangelands for multiple uses. These curricula allow you to acquire the background necessary to adjust easily to variations in specific job opportunities. If you are majoring in either animal science or range science, you must meet general education requirements, have a minimum of 48 credits of upper-division courses (numbered 300 and above), and complete a minimum of 35 credits in courses in the College Agricultural, Consumer and Environmental Sciences.

## Graduate Program Information

The Department of Animal and Range Sciences offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees with majors in animal science and range science. The Doctor of Philosophy degree in animal science is only in the areas of reproductive physiology or ruminant nutrition.

Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum, substantially equivalent to that required of undergraduate students in animal or range science at this institution, 3.0 GPA, and three letters of reference.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects will be required, together with a thesis for most majors. A non-thesis option is available for certain students.

For the Master of Agriculture with specialization in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 Special Research Programs for the creative component.

The Doctor of Philosophy student must demonstrate proficiency in a foreign language or research tool, such as experimental statistics, philosophy of science, computer science, or mathematics. Choice of the research tool will remain the option of the student subject to approval by the student's graduate committee. Demonstration of proficiency may be accomplished by satisfactory completion of courses or by other suitable evidence acceptable to the student's committee. In addition, doctoral students are required to complete advanced courses in a field of study closely related to animal science or range science. The number of courses to be completed in the related area will be determined by the student's committee. Related areas of study often are biology, chemistry, or experimental statistics.

The Department of Animal and Range Sciences is a sponsoring department in the recently approved interdisciplinary graduate degree program that offers both a MS and Ph.D. degree in Water Science Management. The degree program is being handled through the College of Agricultural, Consumer and Environmental Sciences (ACES), and the program description, including application guidelines, classes involved, and topic areas being supported can be found in the catalog under the section describing ACES Programs. Interested students are encouraged to contact the Department Head of Animal and Range Sciences, Shanna Ivey at (575) 646-2515 for more information.

Graduate work in the department is designed to prepare the student for work in the fields of research, extension, teaching, production, and conservation.

Facilities available to graduate students include herds and flocks of the major livestock species, animal nutrition laboratories, physiology laboratories, meats laboratory, small animal laboratory, 25,000-specimen herbarium, two ranches of approximately 92,000 acres, and a 1,000-head experimental feedlot. Active cooperation is maintained with federal research agencies located on and off the campus.

A number of graduate assistantships will be available each year. Inquiries should be addressed to the head of the department.

## Degrees for the Department

Animal Science - Bachelor of Science in Agriculture (p. 108)

Range Science - Bachelor of Science in Agriculture (p. 109)

Agriculture - Master of Agriculture (p. 111)

Animal Science - Master of Science (p. 112)

Range Science - Master of Science (p. 113)

Animal Science - Doctor of Philosophy (p. 113)

Range Science - Doctor of Philosophy (p. 114)

## Minors for the Department

Dairy Science - Undergraduate Minor (p. 110)

Horse Management - Undergraduate Minor (p. 110)

Human Animal Interaction - Undergraduate Minor (p. 110)

Livestock Production - Undergraduate Minor (p. 111)

Ranch Management - Undergraduate Minor (p. 111)

Range Science - Undergraduate Minor (p. 111)

Range Science - Graduate Minor (p. 115)

Animal Science - Graduate Minor (p. 114)

### Professor, Shanna Ivey, Interim Department Head

**Professors** Bailey, Cibils, Duff, Fernald, Hubbert, Holechek, Löest, Soto

**Associate Professors** Ashley, Fasenko, Ganguli, Scholljegerdes, White

**Assistant Professors** Faist, Geli, Summers

**College Track Assistant Professors** Campbell, Fuentes, Pridhoko

**Instructors** Priest

**Co-operators (USDA)** Estell, Herrick, Peters

**Emeritus Faculty** Allred, McDaniel, Ross, Thomas

*S. L. Ivey, Interim Department Head, Ph.D. (New Mexico State University)- ruminant nutrition/microbiology; K. W. Allred, Ph.D. (emeritus, Texas A&M University)- plant taxonomy; R.L. Ashley, Ph.D. (Colorado State University)- physiology of reproduction; D.W. Bailey, Ph.D. (Colorado State University)- rangeland management; A.F. Cibils, Ph.D. (Colorado State University)- grazing management and ecology; G.C. Duff, Ph.D. (New Mexico State University)- animal nutrition; A. Faist, Ph. D. (University Colorado Boulder) - range ecology; G.M. Fasenko, Ph.D. (North Carolina State University)- companion animal management; A. G. Fernald, Ph.D. (Colorado State University)- land use hydrology and water quality hydrology; A.C. Ganguli, Ph.D. (Oklahoma State University)- range restoration; H. M. E. Geli, Ph.D. (Utah State University)- Landscape Hydrology; J. Hernandez-Gifford, Ph.D. (Washington State University)-Reproductive Physiology; J. L. Holechek, Ph.D. (Oregon State)- range ecology; C. A. Löest, Ph.D. (Kansas State University)- ruminant nutrition; K. C. McDaniel, Ph.D. (emeritus, Texas A&M University)- brush management; T. T. Ross, Ph.D. (emeritus, North Carolina State University)- physiology of reproduction and sheep production; E.J. Scholljegerdes, Ph.D. (University of Wyoming)- ruminant nutrition; S.A. Soto-Navarro, Ph.D. (New Mexico State University)- ruminant nutrition; A.F. Summers, Ph.D. (University of Nebraska)-Physiology of reproduction; J. D. Thomas, Ph.D. (emeritus, University of Missouri-Columbia)- meat science; L. M. White, Ph.D. (Clemson)- equine science.*

**Adjunct faculty:** C. D. Allison, Ph.D. (Texas A&M University)- range management; K. M. Harvstad, Ph.D. (Utah State University)- range animal nutrition; J.E. Herrick, Ph.D. (Ohio State University)- soils; M.R. Levi, Ph. D. (University of Arizona)-soil morphology/classification; T.J. Nagaraja, Ph.D. (Kansas State University)-rumen microbiology; D.P. Peters, Ph.D.

(Colorado State University)– landscape ecology; S. Spiegel, Ph.D. (University of California Berkeley)-range management.

**Cooperative Extension Service:** D. Cram, Ph.D. (New Mexico State University)- range science; R. Hagevoort, Ph. D. (Texas A&M University) - dairy science; C. Gifford, Ph. D. (University of Idaho)-animal science; S. Smallidge, Ph.D. (New Mexico State University) - wildlife; J. L. Turner, Ph.D. (Kansas State University)– equine immunology and physiology; M. Ward, Ph.D. (North Dakota State University)- ruminant nutrition; K. Young, Ph.D. (Brigham Young University)-Brush & Weed Specialist

## Animal Science Courses

### **ANSC 100. Introductory Animal Science**

#### **3 Credits**

Orientation and survey of livestock industry in the United States; introduction to feeding, breeding, and management practices for producing farm animals and select companion animals.

### **ANSC 100 H. Introductory Animal Science**

#### **3 Credits**

Orientation and survey of livestock industry in the United States; introduction to feeding, breeding and management practices for producing farm animals and select companion animals. Additional course work will be required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Eligibility for membership in honors college.

### **ANSC 100 L. Introductory Animal Science Laboratory**

#### **1 Credit**

Students will observe and participate in activities related to farm animal management and will include areas of livestock selection, nutrition, reproductive physiology, animal ID and animal health. This lab is required for animal science majors. Pre/

**Corequisite(s):** ANSC 100.

### **ANSC 103. Introductory Horse Science**

#### **3 Credits (2+2P)**

The light horse industry; breeds; introduction to feeding, breeding, marketing and management; handling and selecting horses for breeding and performance.

### **ANSC 112. Companion Animals in Society**

#### **3 Credits**

Examination of the historical, current, and potential future roles of companion animals in human society. Topics include animal domestication, breeds, exotic companion animals, the companion animal industry, and competitions and sports involving companion animals. Emphasis is on canine and feline species. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

### **ANSC 190. Western Equitation I**

#### **2 Credits**

Basic principles of Western riding, including care and management of the riding horse, equitation equipment, and development of riding skills.

### **ANSC 200. Introduction to Meat Animal Production**

#### **3 Credits (2+2P)**

Production and utilization of beef cattle, sheep and swine; emphasis on feeding, breeding, management problems and marketing; selection of animals for breeding and market.

### **ANSC 201. Introduction to Genetics for Animal Production**

#### **3 Credits**

Introduction to genetics and inheritance relative to livestock production. Introduction to procedures for collection and use of performance information in livestock improvement programs.

**Prerequisites:** BIOL 111G.

### **ANSC 205. Introduction to Dairy Science**

#### **3 Credits**

Introduction to the basic aspects of dairy science and how to apply key concepts to the practical feeding and management of dairy cattle and production of dairy products. Students should also obtain an appreciation for the size and diversity of the dairy industry.

**Prerequisite(s)/Corequisite(s):** ANSC 100. Restricted to Las Cruces campus only.

### **ANSC 220. Animal Science Career Development**

#### **1 Credit**

Introduction to scientific disciplines and career options in animal-agriculture career-skill development, including resume preparation, networking, importance of internships, and leadership experiences in animal agriculture.

### **ANSC 250. Special Topics**

#### **1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

### **ANSC 261. Introduction to Animal Metabolism**

#### **3 Credits**

Principles underlying the mechanisms of animal metabolism as they relate to production, maintenance, and health of animals.

**Prerequisite:** CHEM 111G.

### **ANSC 262. Introduction to Meat Science**

#### **3 Credits (2+3P)**

Fundamental aspects of the red meat industry. Lecture topics and laboratory exercises include the nutrient value of meat, meat preservation, meat safety, muscle structure and contraction, slaughter and processing of beef, lamb, and pork, sausage manufacture, meat curing, meat cookery, and muscle and bone anatomy.

### **ANSC 285. Introduction to Companion Animal Science**

#### **3 Credits**

Introduction to the care of common companion animal species. Species specific housing and nutrition are covered in the context of maximizing animal health and well-being and reducing disease. May be repeated up to 3 credits.

### **ANSC 288. Horse Fitting and Selling**

#### **3 Credits**

Preparation of horses for sale; planning and conduct of auction sale; application of marketing principles relating to selling horses.

**Prerequisite:** ANSC 103 or consent of instructor.

### **ANSC 289. Management of Equine Operations**

#### **3 Credits**

Introduction and application of business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

**Prerequisite(s):** ANSC 103 or consent of instructor.

### **ANSC 290. Western Equitation II**

#### **2 Credits**

Intermediate principles of Western riding, including reading horse behavior, limbering-up exercises, and developing riding skills. Introduction to rollbacks, turnarounds and stops.

**Prerequisite:** consent of instructor.

**ANSC 295. Team Competition in Animal Science****1-2 Credits**

Training in team competition in the animal sciences. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**ANSC 301. Animal and Carcass Evaluation****3 Credits (2+2P)**

Determination of the market value of meat animals by relating live animal and carcass traits. Topics include the identification of economically important traits, grading, growth and development, wholesale and retail pricing, and futures and options markets.

**ANSC 302. Therapeutic Horseback Riding I****3 Credits**

Basic principles and understanding of horsemanship and therapeutic riding, including equipment, safety, how to be an effective volunteer, side walker, and horse handler. Consent of instructor required.

**ANSC 303. Livestock, Meat and Wool Evaluation****4 Credits (3+2P)**

Selection, classification, grading, and judging of livestock, meat, and wool.

**ANSC 304. Feeds and Feeding****3 Credits (2+2P)**

Digestibility of feeds, their nutritive values, grades, and classes, principles of ration formulation and computer ration formulations, and practical feeding of farm animals.

**Prerequisite(s):** CHEM 111G, General Chemistry I.

**ANSC 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, BIOL 305, HORT 305 and GENE 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**ANSC 308. Horse Evaluation****4 Credits (2+4P)**

Students will acquire a working knowledge of selection and classification of horses, learn criteria for evaluation and selection of breeding and show animals, gain a broad understanding of judging conformation and performance in the horse, and learn effective oral and written communication skills through defense of class placings. This course is considered an introduction to the NMSU Horse Judging Team.

**ANSC 310. Exhibiting Livestock****3 Credits (1+4P)**

Fitting and showing beef cattle, dairy cattle, sheep and swine.

**ANSC 312V. Companion Animals and the Human- Animal Interaction****3 Credits**

The science behind human-animal interactions (HAI). An examination of the interactions between humans and companion animals and the effects on human and animal health and wellness. Cultural differences in HAI will be explored. Topics will include Animal Assisted Activity (AAA), Animal Assisted Therapy (AAT), and service animals. Emerging and future uses of companion animals in HAI will be discussed.

**ANSC 320. Equine Behavior and Training****3 Credits**

Basic principles, methods and philosophies of handling, breaking and training the two-year-old Western horse. May be repeated up to 6 credits.

**Prerequisite(s):** ANSC 290 or consent of instructor.

**ANSC 321. Advanced Equine Behavior and Training****3 Credits**

Continuation of ANSC 320. Further development of skills required to advance the training of the two-year-old Western horse. Emphasis will be placed on lateral work, lead changes, turn-arounds, obstacles, and making the horse accustomed to ranch and trail riding situations.

**Prerequisite(s):** ANSC 320 or consent of instructor.

**ANSC 325. Food and Agribusiness Finance and Planning****3 Credits**

Same as AG E 325. May be repeated up to 3 credits. Crosslisted with: AG E 325.

**ANSC 350. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**ANSC 351V. Agricultural Animals of the World****3 Credits**

Global study of the development and use of animals for production of food and nonfood products. Climatic, cultural, and economic influences on systems of livestock production and species and breeds of livestock utilized will be evaluated.

**ANSC 353. Advanced Livestock Evaluation****2 Credits**

Advanced selection, classification and grading of livestock. May be repeated up to 2 credits. Consent of Instructor required.

**ANSC 363. Meat Technology****3 Credits**

Structure function and composition of muscles; factors influencing conversion of muscle to meat; buying, palatability and nutritive value of meat and meat products.

**ANSC 370. Anatomy and Physiology of Farm Animals****4 Credits (3+2P)**

Structure and function of the animal body. Includes studies of the horse, cow, sheep, pig, and comparisons with the human body.

**Prerequisite(s):** CHEM 111G and BIOL 111G or BIOL 211G.

**ANSC 383. Equine Reproductive Management****3 Credits (1+4P)**

Anatomy, physiology, and endocrinology of reproduction of the mare and stallion; training in modern reproductive techniques employed in the horse industry.

**Prerequisites:** ANSC 103, ANSC 289, and ANSC 370.

**ANSC 390. Internship****1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

**Prerequisite:** consent of instructor.

**ANSC 391. Undergraduate Research Experience****1-3 Credits (1-3)**

Formal laboratory, library, or field study of problems related to animal sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of three credits. Consent of Instructor required.

**Prerequisite(s):** Consent of Instructor.

**Corequisite(s):** NO.

**ANSC 392. Animal Sciences Teaching/Extension Experience****1-3 Credits (1-3)**

: Formal teaching experience related to animal sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students may also be involved in development, implementation, or assessment of adult or youth educational programs related to animal sciences, supervised by a faculty member. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of three credits. Consent of Instructor required.

**ANSC 395. Team Competition II****1-2 Credits**

Advanced training in team competition in the animal sciences. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**ANSC 402. Animal Science Seminar****1 Credit**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

**ANSC 402 H. Animal Science Seminar****1 Credit**

Taught with ANSC 402 with additional work.

**Prerequisite(s):** Meets Honors eligibility and/or Crimson Scholar status.

**ANSC 411. Canine and Feline Behavior and Training****3 Credits**

The influence of domestication, breeds, genetics, and physiology on the behavior of canine and feline species. Training methods and modification of problem behaviors are examined. The impact of the pet parent on their animal's behavior is addressed. May be repeated up to 3 credits.

**Prerequisite(s):** Junior or Senior status or consent of the instructor.

**ANSC 412. Canine and Feline Health and Diseases****3 Credits**

A review of common infectious and non-infectious diseases and the basics of the immune response. Pathophysiology and treatment of these diseases and the role the pet parent plays in pre-disposing their animals to disease. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC 285 or consent of instructor.

**ANSC 421. Physiology of Reproduction****4 Credits (3+2P)**

Fertility and the role of hormones, nutrition, selection, management and environment in the maintenance of high reproductive rate.

**Prerequisite(s):** ANSC 370.

**ANSC 422. Animal Nutrition****3 Credits**

Nutrient utilization and measurement and nutrient requirements for the various body functions.

**Prerequisite(s):** CHEM 211 or CHEM 313 or ANSC 261.

**ANSC 423. Animal Breeding****3 Credits (2+2P)**

Mating systems, and selection procedures; calculation of inbreeding coefficients, genetic relationships, and gene frequency.

**Prerequisite(s):** ANSC 201 or 305.

**ANSC 424. Swine Production****3 Credits (2+2P)**

Breeding, feeding, and care of swine.

**Prerequisite(s):** ANSC 304.

**ANSC 425. Horse Science and Management****3 Credits (2+2P)**

Senior level course requiring students to apply basic knowledge acquired in the previous courses to solve typical problems encountered in the horse industry. Specific topics include genetics and animal breeding, business and legal issues, reproduction, health, nutrition and exercise physiology.

**Prerequisite(s):** ANSC 304 and ANSC 370 or concurrent registration.

**ANSC 426. Beef Production: Cow-Calf Management****3 Credits (2+2P)**

Senior level course examining management practices for the cow-calf producers. Specifically focusing on nutrition, reproduction, genetics, marketing, and health. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC 304 and (ANSC 201 or ANSC 305) or concurrent registration.

**ANSC 427. Dairy Production****3 Credits (2+2P)**

Breeding, nutrition, physiology and management of dairy cattle.

**Prerequisite(s):** ANSC 304 and (ANSC 201 or ANSC 305) or concurrent registration.

**ANSC 428. Sheep and Wool Production****3 Credits (2+2P)**

Genetics, nutrition, physiology and management of sheep. Wool grading, shearing, and disease control.

**Prerequisite(s):** ANSC 304 and junior status.

**ANSC 429. Beef Production: Feedlot Management****3 Credits**

Senior level course in feedlot management of beef cattle. Topics of interest include cattle handling and processing, health and nutrition, intake management, and growth. Feed mill operation, marketing strategies, and regulatory concerns associated with finishing cattle production may also be discussed.

**Prerequisite(s):** ANSC 304 or Consent of Instructor.

**ANSC 448. Problems****1-4 Credits**

Individual investigation in a specific area of animal science. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**ANSC 458. Livestock Behavior, Welfare and Handling****3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: RGSC 458

**Prerequisite(s):** RGSC 294 or ANSC 100.

**ANSC 462. Parasitology****3 Credits**

Same as EPWS 462.

**ANSC 462 L. Parasitology Lab****1 Credit**

Classification, biological effects, and management of animal parasites of man, domestic animals, and wildlife. One-hour lab is optional. Same as EPWS 462.

**ANSC 468. Advanced Dairy Herd Management****3 Credits**

The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as topics vary. Consent of instructor required.

**Prerequisite(s):** ANSC 304.

**ANSC 480. Environmental Physiology of Domestic Animals****3 Credits**

Influence of environmental factors on physiological processes of domestic animals.

**Prerequisite:** ANSC 370.

**ANSC 484. Ruminant Nutrition****3 Credits**

Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds.

**Prerequisite:** ANSC 422.

**ANSC 488. Equine Nutrition and Exercise Physiology****3 Credits (2+2P)**

Students will gain an in-depth understanding of nutrition and exercise physiology in the horse. Students will investigate the response of major physiological systems to exercise, conditioning and training, gastrointestinal physiology, nutrition requirements and clinical nutrition of the horse.

**Prerequisite(s)/Corequisite(s):** Junior standing or consent of instructor.

**ANSC 501. Advanced Animal Nutrition (so)****3 Credits**

Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied.

Crosslisted with: HNDS 501

**Prerequisite(s):** CHEM 211 or consent of instructor.

**ANSC 504. Animal Physiology Techniques (se)****4 Credits**

Radioimmunoassay procedures. Methods and procedures for conducting reproductive physiology research in livestock. Includes animal preparation, sample collection, laboratory and cell culture procedures.

**Prerequisite:** consent of instructor.

**ANSC 507. Laboratory Techniques in Nutrition (f)****4 Credits (2+6P)**

Methodology and experimental procedures in measuring nutrient requirements and value of diets. Same as HNDS 507.

**Prerequisites:** ANSC 422 or consent of instructor.

**ANSC 509. Endocrinology of Domestic Animals (f)****3 Credits**

The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.

**ANSC 510. Range Nutrition Techniques (se)****3 Credits**

Animal and plant methods of determining quantity and quality of range forage. Same as RGSC 510.

**Prerequisite:** ANSC 484 or consent of instructor.

**ANSC 512. Research Methods in Animal Science (s)****4 Credits (3+2P)**

Procedures used in animal science research, including planning and conduct of investigations and interpretation of results. Same as HNDS 512.

**ANSC 515. Graduate Seminar****1 Credit**

Current topics. Same as HNDS 517.

**ANSC 520. Advanced Nutritional Management I: Feedlot (se)****3 Credits**

Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management.

**Prerequisite:** ANSC 484 or consent of instructor.

**ANSC 521. Advanced Nutritional Management II: Cow Calf/Stocker (so)****3 Credits**

Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management.

**Prerequisite:** ANSC 484 or consent of instructor.

**ANSC 522. Animal Nutrition (f)****3 Credits**

Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 and same as HNDS 522 with additional requirements for graduate students. Recommended for nonmajors. Crosslisted with: HNDS 522

**Prerequisite(s):** CHEM 211.

**ANSC 560. Rumen Microbiology (so)****3 Credits**

Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Same as FSTE 560.

**Prerequisites:** ANSC/HNDS 501.

**ANSC 580. Environmental Physiology of Domestic Animals****3 Credits**

Influence of environmental factors on physiological processes of domestic animals. Specific focus on fetal and developmental programming, heat and cold stress.

**ANSC 588. Equine Nutrition and Exercise Physiology****3 Credits**

Students will gain an in-depth understanding of nutrition and exercise, conditioning and training, gastrointestinal physiology, nutrition requirements and clinical nutrition of the horse.

**Prerequisite(s)/Corequisite(s):** ANSC 304 and ANSC 422.

**ANSC 598. Special Research Programs****1-4 Credits (1-4)**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**ANSC 599. Master's Thesis****15 Credits**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

**ANSC 600. Research****1-15 Credits**

This course is for Ph.D. students before they have completed qualifiers. Consent of Instructor required. Thesis/Dissertation Grading.

**Prerequisite(s):** ANSC 421 or consent of instructor.

**ANSC 602. Advanced Reproductive Physiology (fo)****3 Credits**

Mechanisms of reproductive function; research methodology.

**Prerequisite(s):** ANSC 421 or consent of instructor.**ANSC 602 L. Molecular Techniques in Reproductive Physiology (fo)****2 Credits**

Molecular biology techniques used in the study of reproductive physiology in domestic animals. Extraction of RNA, DNA from endocrine tissues, northern analysis, culture of pituitary/ovarian tissue. Mechanisms of hormone action.

**Prerequisite:** consent of instructor.**ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)****1 Credit**

Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis.

**Prerequisite:** ANSC 509.**ANSC 605. Gonadal and Uterine Endocrinology (fe)****1 Credit**

Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts.

**Prerequisite:** ANSC 509.**ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe)****1 Credit**

Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals.

**Prerequisite:** ANSC 509.**ANSC 621. Metabolic Functions and Dysfunctions (fe)****3 Credits**

Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology. Same as HNDS 621.

**Prerequisites:** CHEM 345 and ANSC 501.**ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo)****4 Credits**

Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants. Same as HNDS 625.

**Prerequisite:** ANSC/HNDS 501.**ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)****4 Credits**

Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use. Same as HNDS 626.

**Prerequisite:** ANSC 501 or HNDS 501.**ANSC 698. Special Research Programs****1-4 Credits**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**ANSC 700. Doctoral Dissertation****15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

## Range Science Courses

**RGSC 150. Rangeland Science Profession****1 Credit**

Introduction to scientific disciplines and career opportunities in rangeland science and management.

**RGSC 250. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**RGSC 294. Rangeland Resource Management****3 Credits**

Overview of arid and semi-arid ecosystems in the US and abroad, rangeland plant physiology, ecology of rangeland plant communities and ecosystems, sustainable management for multiple uses including grazing livestock production, wildlife habitat, recreation and ecosystem services, and economics of rangeland-based enterprises. Restricted to: Main campus only.

**RGSC 302V. Forestry and Society****3 Credits**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.

**RGSC 316. Rangeland Plants****3 Credits (2+3P)**

Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants.

**RGSC 317. Rangeland Communities****3 Credits**

Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

**RGSC 318. Watershed Management****3 Credits (2+2P)**

Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality.

**RGSC 325. Rangeland Restoration Ecology****3 Credits**

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.

**Prerequisite(s):** Sophomore standing or consent of instructor.**RGSC 350. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**RGSC 357. Grass Taxonomy and Identification****3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys.

**Prerequisite/Corequisite(s):** Junior Standing or consent of the instructor.

**RGSC 390. Internship****1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

**Prerequisite:** consent of instructor.

**RGSC 402. Seminar****1 Credit**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

**Prerequisite(s):** Senior standing.

**RGSC 402 H. Range Science Seminar****1 Credit**

Taught with RGSC 402 with additional work.

**Prerequisite(s):** Meets Honors eligibility and/or Crimson Scholar status and senior standing.

**RGSC 406. Rangeland Team Competition****1 Credit**

Description and characteristics of range plants. May be repeated for a maximum of 4 credits.

**RGSC 440. Rangeland Resource Ecology****3 Credits**

Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.

**Prerequisite(s):** Senior standing.

**RGSC 440 L. Rangeland Resource Ecology Lab****1 Credit**

Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. Corerequisite(s): RGSC 440.

**RGSC 448. Problems****1-4 Credits (1-4)**

Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

**RGSC 452. Vegetation Measurements for Rangeland Assessment****4 Credits (2+4P)**

Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results.

**Prerequisite(s):** RGSC 294 and A ST 311.

**RGSC 458. Livestock Behavior, Welfare and Handling****3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458

**Prerequisite(s):** RGSC 294 or ANSC 100.

**RGSC 460. Rangeland and Natural Resource Planning and Management**  
**4 Credits (3+3P)**

Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues.

**Prerequisite(s):** Senior or graduate student standing.

**RGSC 509. Approaches to Rangeland Research****3 Credits**

Experimental design and statistical analysis of experimental results.

**Prerequisite(s):** A ST 505 or consent of instructor.

**RGSC 513. Advanced Rangeland Ecology****3 Credits**

Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.

**Prerequisite(s):** RGSC 440 or equivalent.

**RGSC 515. Graduate Seminar****1 Credit**

Current topics. Graded S/U.

**RGSC 516. Arid Land Management****3 Credits**

Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.

**RGSC 518. Watershed Methods and Management****3 Credits**

Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.

**RGSC 520. Arid Land Plant Herbivore Interactions****3 Credits**

Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

**RGSC 525. Advanced Rangeland Restoration Ecology****3 Credits**

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements. Research paper required for graduate credit.

**RGSC 550. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**RGSC 557. Advanced Grass Taxonomy and Identification****3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit.

**RGSC 589. Landscape Hydrology Modeling****3 Credits**

The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools. Consent of Instructor required. Crosslisted with: WSAM 589.

**RGSC 598. Special Research Program****1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**RGSC 599. Master's Thesis****15 Credits**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

**RGSC 600. Doctoral Research****1-15 Credits**

Research. Consent of Instructor required. Thesis/Dissertation Grading.

**RGSC 616. Advanced Arid Land Management****3 Credits**

In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

**RGSC 620. Advanced Arid Land Plant-Herbivore Interactions****3 Credits**

In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

**RGSC 698. Special Research Programs****1-4 Credits (1-4)**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**RGSC 700. Doctoral Dissertation****15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

**Office Location: Knox Hall 202**

**Phone: (575) 646-2514**

**Website:** <http://aces.nmsu.edu/academics/anrs/>

## Animal Science - Bachelor of Science in Agriculture

The animal industry option includes courses that prepare you for work in many phases of the livestock industry, such as livestock production on farms and ranches, the meat industry, the feed industry, livestock breed associations, and livestock publications. The science option provides

you with a strong background in technical science and prepares you for advanced studies leading to graduate or professional degrees.

## Requirements

### Animal Science Core Requirements <sup>1</sup>

ANSC 100 or ANSC 100 H	Introductory Animal Science (or) Introductory Animal Science	3
ANSC 100 L	Introductory Animal Science Laboratory	1
ANSC 220	Animal Science Career Development	1
ANSC 303	Livestock, Meat and Wool Evaluation	4
ANSC 304	Feeds and Feeding	3
ANSC 370	Anatomy and Physiology of Farm Animals	4
ANSC/RGSC 402 or ANSC 402 H	Animal Science Seminar (or) Animal Science Seminar	1
ANSC 421	Physiology of Reproduction	4
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3
<i>Ag Electives: choose a total of 6 credit with no more than 3 credits in ANSC Experience</i>		6
RGSC 294	Rangeland Resource Management	
ANSC 103	Introductory Horse Science	
ANSC 112	Companion Animals in Society	
ANSC 262	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	
ANSC Experience		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
<i>Other Required Courses</i>		
AXED 201G or COMM 265G	Effective Leadership and Communication in Agricultural Organizations Principles of Human Communication	3
BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
CHEM 111G	General Chemistry I	4
MATH 121G or MATH 191G	College Algebra Calculus and Analytic Geometry I	3
A ST 311	Statistical Applications	3
Select one from the following:		3
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
<i>Select one from the following options:</i>		31-36
Industry Science		
Total Credits		84-89

<sup>1</sup> Required of Industry and Science Options

### Concentration: Animal Industry

#### Required Courses

AG E 260	Introduction to Food and Agribusiness Accounting	3
or ANSC 325	Food and Agribusiness Finance and Planning	
ANSC 200	Introduction to Meat Animal Production	3
ANSC 201	Introduction to Genetics for Animal Production	3
or ANSC 305	Principles of Genetics	
ANSC 261	Introduction to Animal Metabolism	3

**Electives***Production Electives*

Select 9 credits from production courses offered in the department. 9

ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	

*Ranch Management Electives*

Select 3 courses from the following: 9

ANSC 383	Equine Reproductive Management	
ANSC 480	Environmental Physiology of Domestic Animals	
RGSC 316	Rangeland Plants	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
RGSC 458	Livestock Behavior, Welfare and Handling	

*Business Electives*

Select one from the following: 3

ACCT 221	Principles of Accounting I (Financial)	
AG E 305	Marketing and Food Agricultural Products	
AG E 456	Case Studies in Food and Agribusiness Management	
MGT 361	Small Business Management	
MKTG 312	Personal Selling	
Or any ACCT, BUSA, MGT, MKTF numbered 300 & above that are NOT VWW courses		

Total Credits 33

**Concentration: Science****Required Courses**

ANSC 305	Principles of Genetics	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4-8
or CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
BCHE 341	Survey of Biochemistry	3-4
or BCHE 395	Biochemistry I	

**Electives***Production Electives*

Select two from the following: 6

ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	

*Designated Electives*

Select one from the following: 4

MATH 191G	Calculus and Analytic Geometry I	
MATH 192G	Calculus and Analytic Geometry II	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	

Select one from the following: 3

ANSC 462	Parasitology	
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 484	Ruminant Nutrition	
TOX 361	Basic Toxicology	
TOX 461	Toxicology I	

Total Credits 31-36

## Range Science - Bachelor of Science in Agriculture

The following course work prepares you for study and management of rangelands through an integrated ecological approach with special emphasis on rangeland plants, livestock, wildlife, soils and watersheds. The course work is also well designed for those who want to continue study in graduate school. Any undergraduate student majoring in Range Science must earn a grade of C- or higher in Range Science (RGSC prefix) courses to satisfy degree requirements. Students earning a D or F in a Range Science (RGSC prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in rangeland resources, as well as the University requirements for General Education (p. 46), Viewing a Wider World (p. 46) and electives to bring the total credits to 120, with 48 credits being upper division.

## Requirements

**Range Science Core**

RGSC 150	Rangeland Science Profession	1
RGSC 294	Rangeland Resource Management	3
RGSC 302V	Forestry and Society	3
RGSC 316	Rangeland Plants	3
RGSC 317	Rangeland Communities	3
RGSC 318	Watershed Management	3
RGSC 325	Rangeland Restoration Ecology	3
RGSC 357	Grass Taxonomy and Identification	3

RGSC 402	Seminar	1
RGSC 440	Rangeland Resource Ecology	3
RGSC 440 L	Rangeland Resource Ecology Lab	1
RGSC 452	Vegetation Measurements for Rangeland Assessment	4
RGSC 460	Rangeland and Natural Resource Planning and Management	4
<b>Other Required Courses</b>		
A ST 311	Statistical Applications	3
ANSC 261	Introduction to Animal Metabolism	3-4
or CHEM 211	Organic Chemistry	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	3
or COMM 265G	Principles of Human Communication	
BIOL 111G	Natural History of Life	3
BIOL 211G	Cellular and Organismal Biology	3
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
EPWS 314	Plant Physiology	3
FWCE 255	Principles of Fish and Wildlife Management	3
Select one from the following:		4
GEOG 381	Cartography and Geographic Information Systems	
A 300/400-level GIS Course		
MATH 121G	College Algebra	3
PHIL 100G	Philosophy, Law and Ethics	3
or PHIL 223G	Ethics	
SOIL 252	Soils	3
SOIL 252 L	Soils Laboratory	1
SOIL 472	Soil Morphology and Classification	4
<b>Natural Resource Management</b>		<b>6</b>
AG E 337V	Natural Resource Economics	
AG E 384V	Water Resource Economics	
AG E 385	Applied Production Economics	
AG E 456	Case Studies in Food and Agribusiness Management	
FWCE 110G	Introduction to Natural Resources Management	
FWCE 255	Principles of Fish and Wildlife Management	
FWCE 437	Wildlife Damage Management	
RGSC 302V	Forestry and Society	
<b>ANSC Elective</b>		<b>3</b>
ANSC 100	Introductory Animal Science	
ANSC 304	Feeds and Feeding	
ANSC 351V	Agricultural Animals of the World	
ANSC 422	Animal Nutrition	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
ANSC 458	Livestock Behavior, Welfare and Handling	
Select one from the following:		3
ECON 201G	Introduction to Economics	

ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
<b>Total Credits</b>		<b>94-95</b>

## Dairy Science - Undergraduate Minor

A minor in Dairy Science consists of at least 18 credits.

<b>Core ANSC courses (all of the following are required)</b>		<b>12</b>
ANSC 100	Introductory Animal Science (or or ANSC 100 HIntroductory Animal Science	
ANSC 205	Introduction to Dairy Science	
ANSC 304	Feeds and Feeding	
ANSC 325	Food and Agribusiness Finance and Planning	
<b>Dairy Science Electives (choose 6 credit hours):</b>		<b>6</b>
ANSC 427	Dairy Production	
ANSC 468	Advanced Dairy Herd Management	
<i>ANSC Science Experience (no more than 3 credits; must be in field of dairy science):</i>		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
<b>Total Credits</b>		<b>18</b>

## Horse Management - Undergraduate Minor

A minor in Horse Management consists of at least 18 credits.

<b>Required Courses</b>		
<i>All of the following:</i>		
ANSC 103	Introductory Horse Science	3
ANSC 425	Horse Science and Management	3
Choose two of the following courses:		6-7
ANSC 289	Management of Equine Operations	
ANSC 302	Therapeutic Horseback Riding I	
ANSC 308	Horse Evaluation	
Choose 3 credits of the following:		3
ANSC 288	Horse Fitting and Selling	
ANSC 290	Western Equitation II	
ANSC 320	Equine Behavior and Training	
ANSC 321	Advanced Equine Behavior and Training	
ANSC 390	Internship	
Choose one of the following:		3
ANSC 383	Equine Reproductive Management	
ANSC 488	Equine Nutrition and Exercise Physiology	
<b>Total Credits</b>		<b>18-19</b>

## Human Animal Interaction - Undergraduate Minor

A minor in Human Animal Interaction consists of at least 18 credits.

**Required Courses**

ANSC 112	Companion Animals in Society	3
ANSC 285	Introduction to Companion Animal Science	3
ANSC 312V	Companion Animals and the Human-Animal Interaction	3
ANSC 390	Internship <small>Must complete 3 credit hours of internship</small>	1-3
ANSC 411	Canine and Feline Behavior and Training	3
ANSC 412	Canine and Feline Health and Diseases	3
Total Credits		16-18

## Livestock Production - Undergraduate Minor

A minor in Livestock Production consists of at least 18 credits. Animal science majors may NOT minor in Livestock Production.

**Core ANSC Courses****All of the following**

ANSC 100	Introductory Animal Science	3
ANSC 304	Feeds and Feeding	3

*Production Electives*

Choose 6 credits of the following: 6

ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	

*ANSC Electives*

Choose 6 credits of the following: 6

ANSC 301	Animal and Carcass Evaluation	
ANSC 363	Meat Technology	

Or any ANSC course numbered 300 and above Only one ANSC VVV is eligible towards minor

Total Credits 18

## Ranch Management - Undergraduate Minor

The Ranch Management minor consists of at least 18 credits. Animal science majors may NOT minor in ranch management.

**Core ANSC Courses**

ANSC 100	Introductory Animal Science	3
ANSC 304	Feeds and Feeding	3

*Production Electives*

Choose 2 of the following 6

ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	

*Range Electives*

RGSC 294	Rangeland Resource Management	3
Choose 3 credits from the following		3
RGSC 302V	Forestry and Society	
RGSC 316	Rangeland Plants	
RGSC 317	Rangeland Communities	
RGSC 318	Watershed Management	
RGSC 440	Rangeland Resource Ecology	
Total Credits		18

## Range Science - Undergraduate Minor

A minor in Range Science consists of at least 18 credits in courses with a RGSC prefix and achieve a C- or higher in all RGSC classes.

Choose 18 credits from the following courses 18

RGSC 294	Rangeland Resource Management	
RGSC 302V	Forestry and Society	
RGSC 316	Rangeland Plants	
RGSC 317	Rangeland Communities	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
RGSC 440 L	Rangeland Resource Ecology Lab	
RGSC 452	Vegetation Measurements for Rangeland Assessment <small>RGSC 294 &amp; A St 311 are pre-requisites for this course</small>	
RGSC 458	Livestock Behavior, Welfare and Handling	
RGSC 460	Rangeland and Natural Resource Planning and Management	

Total Credits 18

## Agriculture - Master of Agriculture Concentration: Domestic Animal Biology

The Department of Animal and Range Sciences at New Mexico State University offers a non thesis coursework Master of Agriculture degree with a Concentration in Domestic Animal Biology (MAG-DAB) which provides students with graduate training in animal nutrition and physiology. The degree is earned after satisfactory completion of 32 credit hours of upper division and graduate-level courses. The curriculum is completed in two or three academic semesters and includes a creative component which can be met in several ways.

Students having an undergraduate degree in an area of agriculture or a related field may consider the MAG-DAB as an alternative to a Master of Science which traditionally involves preparation of a thesis. Students who may benefit from this program include those in need of additional advanced science-based coursework in preparation for applying to a professional program in veterinary medicine. Other individuals may be interested in careers in the cooperative extension service, education, or the feed and pharmaceutical industries where an advanced degree may be of benefit to advancement. The curriculum outlined below will assist students in preparing for a number of career opportunities.

## Admission to the Program

The MAG-DAB program is administered through the Department of Animal and Range Sciences and is coordinated by the Animal Science Graduate Committee. Admission to the program requires acceptance by the NMSU Graduate School as well as the Department of Animal and Range Sciences. Basic requirements include an undergraduate degree in an agricultural or a related major from an accredited college or university and an undergraduate GPA of 3.0.

Depending on undergraduate training, some individuals may need to complete deficiency classes. In addition, the graduate school may require international students to complete one or more English language courses. Applications to the Department should include three letters of reference, a resume, and a statement of interest in advanced graduate training.

Once admitted to the program, each student will work with an advisor to develop a course work plan of study. The advisor and the student will also select an advisory committee consisting of two departmental faculty members and a third member from outside the department who will normally serve as the Dean's representative to the committee.

Inquiries about the MAG-DAB Program should be directed to the Chair of the Animal Science Graduate Committee.

For the Master of Agriculture with a concentration in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 Special Research Programs for the creative component.

**All students in the MAG-DAB Program will complete the following classes:** 18

ANSC 480	Environmental Physiology of Domestic Animals	3
ANSC 484	Ruminant Nutrition	3
ANSC 501	Advanced Animal Nutrition (so)	3
ANSC 509	Endocrinology of Domestic Animals (f)	3
ANSC 512	Research Methods in Animal Science (s)	4
ANSC 515	Graduate Seminar <sup>1</sup>	1

### Elective Courses

In consultation with their graduate advisor, students choose at least 12 credits from the following list of core courses (other classes may be considered on an individual basis): 12

ANSC 462	Parasitology	
ANSC 504	Animal Physiology Techniques (se)	
ANSC 507	Laboratory Techniques in Nutrition (f)	
ANSC 520	Advanced Nutritional Management I: Feedlot (se)	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker (so)	
ANSC 560	Rumen Microbiology (so)	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)	
ANSC 605	Gonadal and Uterine Endocrinology (fe)	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation (fe)	

ANSC 621      Metabolic Functions and Dysfunctions (fe)

<sup>1</sup> must take two semesters of seminar

## Creative Component

The creative component of the program involves completing at least two credits of ANSC 598 Special Research Programs. This requirement can be met in one of two ways. In consultation with the advisor, the student can select a topic of importance in domestic animal biology and prepare a comprehensive literature review covering that topic. An alternative way to meet this requirement is for the student, in consultation with the advisor, to conduct a research project and prepare a written manuscript for evaluation by the advisory committee. In either case, the student will present results of the project in the graduate Seminar (ANSC 515) and then be examined by the advisory committee.

In certain cases, the student may request approval from the Advisory Committee to complete two additional graduate courses (at least six credits) in lieu of one of the reports described above. If this approach is approved, the oral examination at the end of the program will cover all the courses completed during the MAG-DAB Program. Students pursuing this option must also prepare and present a topical seminar in ANSC 515 at some time during the program.

## Animal Science - Master of Science Requirements for Master of Science Degree in Animal Science Admission

1. GPA of 3.0 or greater.
2. Three letters of recommendation.
3. Completion of the form, "Application for Graduate Admission in Animal Science" including a brief letter (personal statement) outlining the student's background, career goals, and research interest.
4. Resume
5. Favorable evaluation for admission will be by consensus of the Animal Science Graduate Committee and will be contingent on availability of an advisor and research funding.
6. A requirement for admission as a masters graduate student in the department is completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined initially by the Animal Science Graduate Committee.

## General Requirements

**A. Graduate students must maintain at least a 3.0 grade point average.**

**B. A minimum of 30 credit hours of graduate work is required of which:**

1. At least 15 credits must be in courses numbered 500 or above
2. At least 15 credits must be in Animal Science courses
3. At least 15 credits (exclusive of ANSC 598) must be taken with other than a single professor

**C. Designated hours to be completed:**

1. At least four formal Animal Science courses numbered 500 or above
2. At least six credits in ANSC 599 (Master's Thesis)

3. At least two credits in ANSC 515 (Graduate Seminar)
4. At least four credits in Experimental Statistics

#### D. Graduate Assistants

1. All graduate assistants must enroll as full-time students taking at least 9 graded graduate credits (courses numbered 450 and above). No audits can be taken as part of the 9 minimum credits. Only 3 of the 9 credits may be taken as an S/U option.
2. A graduate assistant may not enroll for more than 15 credits each semester.
3. If a student needs to take deficiency courses as part of the 9 credits, then a memo from the advisor or department head should be submitted to the Graduate School. If approved, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at New Mexico State University.
4. Enrollment during summer sessions is not required.

#### E. Additional Requirements

1. A maximum of six credits in S/U courses may be taken during a Master's program
2. A maximum of six credits (four in a single semester) in ANSC 598 (Special Research Programs) may be taken during a Master's program.
3. If a minor is declared, a minimum of eight credits in this discipline must be completed and approved by that department.
4. In certain instances, deficiency courses may be required.
5. Attendance at graduate seminars is urged.
6. Graduate students are encouraged to adapt their thesis data for submission as a scientific journal article, an Experiment Station Bulletin, or research report.

#### F. The Masters Committee

The Masters Committee is appointed by the student's advisor with the approval of the Department Head and consists of four members including three from the animal science area and one representative from the Graduate School.

#### G. The Masters Final Examination

The Masters Final Oral Examination is primarily concerned with the thesis research conducted by the student but it may also extend over the entire discipline. Candidates for a Masters Degree are expected to demonstrate a thorough understanding of their research topic including how it was conducted, the results that were found, and what the results mean. They should also demonstrate knowledge of the general discipline of Animal Science.

## Range Science - Master of Science

A GPA of 3.0 or higher is required for admission. GRE exam is not required. Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined by the admissions committee and the student's graduate committee and advisor.

## Graduate Program with the Thesis (Research) Option

A minimum of 30 credits of graduate work is required to graduate. At least one advanced statistics course or equivalent is required, as determined by the student's graduate committee. The thesis research project must be approved by the student's graduate committee. Every effort should be made to publish the thesis as a scientific journal article or Experiment Station publication.

## Graduate Program with the Non-Thesis Option

A minimum of 32 credits of graduate work is required to graduate. A final written report is required.

The report will be on a topic approved by the student's graduate committee. Research for the report may involve field work and data gathering, but should also be strongly library- and literature-based.

The report should be of graduate quality and content, and should follow graduate school thesis format or the format of an acceptable scholarly journal. Final approval and acceptance of the report will be by the student's graduate committee. Every effort should be made to publish the report in an appropriate outlet (journal article, Experiment Station bulletin or report, Extension bulletin, etc.)

## Animal Science - Doctor of Philosophy

### Requirements for Ph.D. Degree in Animal Science

#### Admission

1. GPA of 3.0 or greater.
2. Three letters of recommendation.
3. Completion of the form, "Application for Graduate Admission in Animal Science" including a brief letter (personal statement) outlining the student's background, career goals, and research interest.
4. Resume
5. Favorable evaluation for admission will be by consensus of the Animal Science Graduate Committee and will be contingent on availability of an advisor and research funding.
6. A requirement for admission as a doctoral graduate student in the department is completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined initially by the Animal Science Graduate Committee.
7. Non-thesis MS degrees are not acceptable although some of the courses may be transferred if deemed appropriate by the student's Doctoral Committee.

#### General Requirements

1. Graduate students must maintain at least a 3.0 grade point average.
2. A minimum of 90 credit hours of graduate work is required of which:
  - a. At least 30 credits must be in courses numbered 600 or above.
  - b. At least 18 credits must be in ANSC 700 (Doctoral Dissertation).

3. All graduate assistants must enroll as full-time students taking at least 9 graded graduate credits (courses numbered 450 and above). No audits can be taken as part of the 9 minimum credits. Only 3 of the 9 credits may be taken as an S/U option.
  - a. A graduate assistant may not enroll for more than 15 credits each semester.
  - b. If a student needs to take deficiency courses as part of the 9 credits, then a memo from the advisor or department head should be submitted to the Graduate School. If approved, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at New Mexico State University.
  - c. Enrollment during summer sessions is not required.
4. Students admitted to the Doctoral program (passed qualifying exam) must continue to enroll in three credits of graduate work each semester (exclusive of summer sessions) until the dissertation is approved by the Graduate School.
5. In certain instances, deficiency courses may be required.
6. Two semesters of ANSC 515(Graduate Seminar) are required and students are urged to attend seminar every semester that they are in residence.
7. No more than 6 credits of ANSC 698 may apply toward graduation.
8. The "Program of Study and Committee for Doctoral Students" form listing the graduate committee and courses to be taken, should be filed with the Graduate School after completion of 12 credits and after the qualifying exam, and before registering for additional courses.
  - a. Prepare and file a preliminary program of study with the Graduate Dean
  - b. Provide counsel for the student during the program
  - c. Attend the comprehensive oral examination and the final dissertation defense.

**NOTE:** Changes in committee membership must be approved by the Graduate Dean.

## Range Science - Doctor of Philosophy

A GPA of 3.0 or higher is required for admission. GRE exam is required. Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined by the admissions committee and the student's graduate committee and advisor.

A minimum of 30 credits of graduate work plus 18 credits of dissertation (RGSC 700) are required to graduate. The Qualifying Exam will take place during the first semester of graduate work. Its purpose is to evaluate the student's strengths and weaknesses, determine deficiency courses, and discuss a possible program of study (coursework). The "Program of Study and Committee for Doctoral Students" form, listing the graduate committee and courses to be taken, should be filed with the Graduate School after completion of 12 credits and after the qualifying exam, and before registering for additional courses. The Comprehensive Exam is intended to test the knowledge of the major and minor fields of study. The student will be admitted to the exam after fulfilling the language/research tool requirement, after completion of adequate coursework (as determined by the department and the Graduate School), and when considered by the student's graduate committee to be adequately prepared. The exam is part written and part oral. The student is formally considered a candidate for the Ph.D. only after the successful completion of the comprehensive exam, the recommendation of the committee, and the approval of the graduate dean.

The research project must be approved by the student's graduate committee. The dissertation is expected to demonstrate the student's ability in independent investigation and to be a contribution to human knowledge. It shall display a mastery of the literature, present an organized, coherent development of ideas with a clear exposition of results, and provide a critical discussion of the student's conclusions. Every effort should be made to publish the dissertation as scientific journal articles. Final Exam is concerned primarily with the research work of the student as embodied in the dissertation, but it may also extend over the entire field of study. It is entirely oral. The final exam will be advertised to the public one week prior to the exam.

## Animal Science - Graduate Minor

A minimum of 9 credit hours in graduate level classes with the ANSC prefix are required to obtain a graduate minor in Animal Science. Approval by the Animal and Range Sciences Department Head is required.

### Qualifying Examination

1. The Animal and Range Sciences Department may allow the M.S. Final examination to serve as a Ph.D. qualifying exam for students receiving an M.S. in Animal Science at NMSU. See "Guidelines for Graduate Studies" for further details.
2. Doctoral students must take a qualifying exam before completion of one semester of graduate work. The exam is scheduled by the student's advisor and administered by a provisional committee of at least 3 regular Animal Science faculty members in the student's area of concentration (reproductive physiology or ruminant nutrition). Its purpose is to evaluate the student's strengths and weaknesses, determine deficiency courses, and discuss a possible program of study (coursework).
3. After successful completion of this exam, a Doctoral Committee is appointed.

### Doctoral Committee

1. The student's Doctoral Committee is selected by the student and the student's advisor, with approval of the Department Head and the Graduate Dean. The committee will consist of five or more members, as follows:
  - a. The committee chair (advisor) and at least two other members must be from the regular Animal Science faculty in the student's concentration area (reproductive physiology or ruminant nutrition).
  - b. One member must be from the Related Area.
  - c. One member from the Research Tool Area.
  - d. The member from the Related or Research Tool Area may serve as the Representative of the Graduate Dean.
2. Duties of the Doctoral Committee

## Range Science - Graduate Minor

A minimum of 9 credit hours in graduate level classes with the RGSC prefix are required to obtain a graduate minor in Range Science. Approval by the Animal and Range Sciences Department head is required.

## Entomology, Plant Pathology and Weed Science

### Undergraduate Program Information

Specific courses that meet these and the university general education requirements and additional courses in biology, chemistry, mathematics and seminar are included below in departmental requirements. A total of 120 credits are required for graduation. At least 48 credits must be 300-level courses and above. Schedules in specific semesters will be developed with the help of a student's academic advisor.

### Graduate Program Information

The complexity of managing insects, plant diseases, and weeds is increasing environmental concerns, costs, and regulations requiring an integrated approach to management strategies. Future professionals in integrated pest management will be ecologically oriented, trained to manipulate biological and cultural technologies while minimizing chemical control options. The Master of Science degree program in agricultural biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound protection of plants and animals from a wide and varied spectrum of pests. Students will be prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Ph.D. programs. Specific opportunities will include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, and industry research and environmental technicians. There is currently a strong need for MS graduates trained in these areas, and the demand is expected to increase dramatically.

Students may wish to concentrate their graduate program in entomology, plant pathology, or weed science, or conversely may wish to be broadly trained in all three pest-management disciplines. Most students will be expected to complete a thesis. A non-thesis option is available, depending on prior training and experience and subject to approval by the department head. A nonthesis research option requires completion of a research paper, suitable as judged by the student's graduate committee, for journal publication. Completion of an undergraduate degree essentially equivalent to that offered by the department is required for admission to the MS graduate program. Qualifications for admission will be reviewed by the departmental Graduate Admissions committee. Prospective graduate students must have at least a 3.0 undergraduate GPA, complete the GRE, and submit an official transcript, a letter of intent and three letters of recommendation.

## Degrees for the Department

Agricultural Biology - Bachelor of Science in Agriculture (p. 118)

Agricultural Biology - Master of Science (p. 120)

## Minors for the Department

Entomology - Undergraduate Minor (p. 120)

Pest Management - Undergraduate Minor (p. 120)

Plant Pathology - Undergraduate Minor (p. 120)

Weed Science - Undergraduate Minor (p. 120)

**Professor, Gerald K. Sims, Department Head**

**Professors** Creamer, Bundy, Sanogo, Thomas, Thompson; **Associate Professors** Hanson, Mesbah, Pierce; **Assistant Professors** Lehhoff, Romero, Schutte; **Affiliated Faculty** Schroeder, Sweet, Bleiweiss; **College Assistant Professor** Lewis; **College Associate Professor** Randall; **Emeritus Professor** Arnold, Richman

*G.K. Sims, Department Head, Ph.D. (Purdue)– soil microbiology; weed science; C. S. Bundy, Ph.D. (Georgia)– entomology; R. Creamer, Ph.D. (California-Davis)– plant pathology; N.P. Goldberg, Ph.D. (Arizona)– plant pathology; S. Hanson, Ph.D. (University of Wisconsin)– molecular plant pathology; E. Lehnhoff, Ph.D. (Montana State) Ecology and Environmental Science; B. E. Lewis, M.S. (New Mexico State)– economic entomology; A.O. Mesbah, Ph.D. (University of Wyoming)– weed science; J. Breen Pierce (Rutgers)– entomology; J. Randall, Ph.D. (New Mexico State University)– plant pathology; A. Romero, Ph.D. (University of Kentucky)– Entomology; S. Sanogo, Ph.D. (Pennsylvania State)– plant pathology; B. Schutte, Ph.D. (Ohio State)– Horticulture & Crop Science; C. A. Sutherland, Ph.D. (Oregon State)– extension entomology; S. H. Thomas, Ph.D. (Iowa State)– nematology; D.C. Thompson, Ph.D. (Colorado State)– entomology.*

## Entomology, Plant Pathology and Weed Science Courses

### EPWS 100. Applied Biology

#### 3 Credits

Introduction to applied biology and ecology focusing on insects, plants and pathogens in natural areas, crops and urban settings. EPWS 100L is strongly recommended to take in the same semester. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

### EPWS 100 L. Applied Biology Lab

#### 1 Credit

Study of applied biology and ecology of insects, plants and pathogens in natural areas, crops, and urban settings. EPWS 100 strongly recommended to take in the same semester. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

### EPWS 200. Special Topics

#### 1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

### EPWS 300. Special Topics

#### 1-4 Credits

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

### EPWS 301. Agricultural Biotechnology

#### 3 Credits (2+2P)

The principles of molecular biology will be introduced and used to explore the past, present, and future applications of biotechnology in agriculture. Specific topics include methodologies for making transgenic plants with increased pest resistance, the use of biotechnology in pest detection, and improving nutritional value. The laboratory will provide students with hands-on experience with equipment used for biotechnology research.

**Prerequisites:** CHEM 112G, BIOL 111G, or BIOL 211G.

**EPWS 302. General Entomology****4 Credits**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

**Prerequisite(s):** BIOL 111G or 211G.

**EPWS 303. Economic Entomology****3 Credits (3+2P)**

Identification and life cycles of insects of economic significance, their relationship to humans and agriculture including biological interactions and controls. May be repeated up to 3 credits.

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 310. Plant Pathology****4 Credits (3+2P)**

Causes and methods of prevention and treatment of diseases in plants.

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 311. Introduction to Weed Science****4 Credits (3+2P)**

Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Crosslisted with: AGRO 311.

**Prerequisite(s):** CHEM 111G, and BIOL 211G.

**EPWS 314. Plant Physiology****3 Credits**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Same as BIOL 314.

**Prerequisites:** BIOL 211G, CHEM 112G.

**EPWS 325V. Insects, Humans, and the Environment****3 Credits**

Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present day, and future impacts in underdeveloped, developing, and developed civilizations.

**EPWS 373. Fungal Biology****3 Credits (2+2P)**

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 373.

**Prerequisites:** EPWS 310 or BIOL 311, or consent of instructor.

**EPWS 380V. Science & Society****3 Credits**

Analysis and evaluation of how human activities affect the earth's environment or ecosystems. Several examples, from global issues to local issues will be studied in detail. Current science and the intersection of science and public policy will be discussed in relation to problems like world population, agricultural productivity, deforestation, medical advances, and future prospects for the environment. May be repeated up to 3 credits.

**EPWS 390. Internship****1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**EPWS 420. Environmental Behavior of Pesticides****3 Credits**

Behavior of pesticide compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 211 recommended prior to course. May be repeated up to 3 credits.

**EPWS 447. Seminar****1 Credit**

Organization and techniques for the oral presentation of research information. Restricted to: Main campus only.

**EPWS 449. Special Problems****1-3 Credits**

Individual investigation in specific areas of entomology, plant pathology or plant physiology. Maximum of 3 credits per semester and a grand total of 6 credits.

**EPWS 451. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**Prerequisite:** consent of instructor.

**EPWS 455. Advanced Integrated Pest Management****3 Credits**

Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Crosslisted with: EPWS 505.

**Prerequisite(s):** Either EPWS 303 or EPWS 310 or EPWS 311, or consent of instructor.

**EPWS 456. Biological Control****3 Credits**

Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506.

**Prerequisite:** introductory course in entomology.

**EPWS 462. Parasitology****3 Credits**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.

**EPWS 462 L. Parasitology Lab****1 Credit**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife. May be repeated up to 1 credits.

**EPWS 471. Plant Mineral Nutrition****3 Credits**

Same as HORT 471 and AGRO 471.

**EPWS 475. Urban Entomology****3 Credits**

Identification and life cycles of insects in urban environments, their relationship to humans, agriculture, biological interactions and controls

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 481. Plant Nematology****3 Credits (2+2P)**

Biology, ecology and basic identification of soil-inhabiting nematodes, with emphasis on host-parasite relationships and management principles for plant-parasitic genera.

**EPWS 486. Plant Virology****3 Credits**

An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.

**EPWS 492. Diagnosing Plant Disorders****3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as AGRO 492 and HORT 492.

**Prerequisites:** EPWS 303, EPWS 310.

**EPWS 502. General Entomology****4 Credits**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

**Prerequisite(s):** BIOL 111G or BIOL 211G.

**EPWS 505. Advanced Integrated Pest Management****3 Credits**

Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Crosslisted with: EPWS 455.

**Prerequisite(s):** EPWS 303 or EPWS 310 or EPWS 311 or consent of instructor.

**EPWS 506. Biological Control****3 Credits**

Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. Credit cannot be given for both EPWS 456 and EPWS 506.

**Prerequisite:** introductory course in entomology.

**EPWS 511. Introduction to Weed Science (f)****4 Credits (3+2P)**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Crosslisted with: AGRO 511.

**Prerequisite(s):** CHEM 111G and BIOL 211G.

**EPWS 514. Plant Physiology****3 Credits**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development.

**Prerequisite(s):** BIOL 211G, CHEM 112G.

**EPWS 520. Environmental Behavior of Pesticides (so)****3 Credits**

Behavior of these compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 211 recommended prior to course. May be repeated up to 3 credits.

**EPWS 525. Scientific Writing- How to be a Productive and Effective Writing****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, HORT 525 and SOIL 525.

**EPWS 549. Special Problems****1-4 Credits**

Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.

**EPWS 551. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**EPWS 573. Fungal Biology****3 Credits (2+2P)**

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 573.

**Prerequisite:** EPWS 310 or consent of instructor.

**EPWS 575. Urban Entomology****3 Credits**

Identification and life cycles of insects in urban environments, their relationship to humans, agriculture, biological interactions and controls

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 590. Graduate Seminar****1 Credit**

Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree.

**EPWS 598. Graduate Internship****1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

**EPWS 599. Master's Thesis****15 Credits**

Thesis.

**Name:** Entomology, Plant Pathology & Weed Science Department

**Office Location:** Skeen Hall, Room N141

**Phone:** (575) 646-3225

**Email:** [eppwsdep@nmsu.edu](mailto:eppwsdep@nmsu.edu)

**Website:** <http://eppws.nmsu.edu/>

# Agricultural Biology - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate options that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

## Requirements

### Departmental Requirements

A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 111G	Natural History of Life	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
ENGL 111G	Rhetoric and Composition	4
EPWS 100	Applied Biology	3
EPWS 100 L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
MATH 121G	College Algebra	3
Select one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
Select one from the following:		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
<b>General Education Electives</b>		
Humanities and Fine Arts		6-9
Social and Behavioral Sciences		6-9
<b>Viewing a Wider World</b>		
Select 6 credits at the 300 or 400 Level <sup>1</sup>		6

### Concentrations

Select at least one from the following: <sup>2</sup>	37-46
Applied Biology	
Applied Microbiology	
Entomology	
Environmental Biology	
Pest Biology and Management	
Total Credits	114-129

- <sup>1</sup> Select two General Education Courses: one must be from a college outside of the College of Agricultural, Consumer and Environmental Sciences.
- <sup>2</sup> In addition to the departmental requirements listed above, you must also complete all of the courses in at least one of the options listed below. Courses with higher numbered prefixes may replace courses listed as departmental requirements in some cases.

## Agricultural Biology Concentrations/Options

### Concentrations: Applied Biology

The Applied Biology option prepares you for professional advancement including admittance to medical, dental, veterinary and graduate schools. Students interested in the health professions must register with the Health Professional Advisory Committee no later than the sophomore year. Students should check the specific entrance requirements for the professional or graduate school of their choice prior to selecting electives within this option.

### Required Courses

BCHE 341	Survey of Biochemistry	4
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 190G	Trigonometry and Precalculus	4
MATH 191G	Calculus and Analytic Geometry I	4
PHYS 211G	General Physics I	3
or PHYS 221G	General Physics for Life Sciences I	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 221GL	Laboratory to General Physics for Life Science I	
Select 6-8 credits from the following:		6-8
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 481	Plant Nematology	
<b>Suggested Electives</b>		
MATH 192G	Calculus and Analytic Geometry II	4
PHYS 212G	General Physics II	3
or PHYS 222G	General Physics for Life Sciences II	
Total Credits		37-39

## Concentration: Applied Microbiology

The Applied Microbiology option prepares you for professional positions in algal biofuels, environmental monitoring and improvement, industrial applications of microbiology, food sanitation, research or graduate study.

### Required Courses

BCHE 341	Survey of Biochemistry	4
BIOL 311 L	General Microbiology Laboratory	2
BIOL 451	Physiology of Microorganisms	3
BIOL 473	Ecology of Microorganisms	3
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
EPWS 373	Fungal Biology	3
EPWS 420	Environmental Behavior of Pesticides	3
EPWS 486	Plant Virology	3
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 211G	General Physics I	3
PHYS 212GL	General Physics II Laboratory	1
Select 6-7 credits from the following:		6-7
A ST 456	Statistical Methods and Data Analysis	
AGRO 471	Plant Mineral Nutrition	
BIOL 477	Applied and Environmental Microbiology	
E S 301	Principles of Ecology	
E S 370	Environmental Soil Science	
EPWS 455	Advanced Integrated Pest Management	
EPWS 462	Parasitology	
EPWS 481	Plant Nematology	
EPWS 492	Diagnosing Plant Disorders	
FSTE 320	Food Microbiology	
SOIL 252	Soils	
SOIL 312	Soil Management and Fertility	
SOIL 476	Soil Microbiology	
TOX 361	Basic Toxicology	
Total Credits		42-43

## Concentration: Entomology

The Entomology concentration prepares you for graduate degrees in entomology. Emphasis is placed on a broad background in field and laboratory aspects of insect biology and management.

### Required Courses

MATH 142G	Calculus for the Biological and Management Sciences	3
BIOL 465	Invertebrate Zoology	4
CHEM 211	Organic Chemistry	4
EPWS 303	Economic Entomology	3
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 462	Parasitology	3
EPWS 475	Urban Entomology	3
EPWS 481	Plant Nematology	3
EPWS 492	Diagnosing Plant Disorders	3

Select at least three from the following:		7-11
EPWS 314	Plant Physiology	
EPWS 451	Special Topics	
EPWS 456	Biological Control	
EPWS 486	Plant Virology	
BIOL 301	Principles of Ecology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
SOIL 252	Soils	
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 436	Disease Vector Biology	
BIOL 462	Conservation Biology	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 480	Animal Behavior	
GENE 452	Applied Bioinformatics	
E S 301	Principles of Ecology	
Total Credits		39-43

## Concentration: Environmental Biology

The Environmental Biology option prepares you for professional positions in environmental impact, regulation, compliance and improvement.

### Required Courses

CHEM 211	Organic Chemistry	4
E S 301	Principles of Ecology	3
E S 330	Environmental Management Seminar I	1
E S 430	Environmental Management Seminar II	1
EPWS 380V	Science & Society	3
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 492	Diagnosing Plant Disorders	3
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 211G	General Physics I	3
PHYS 211GL	General Physics I Laboratory	1
SOIL 252	Soils	3
TOX 361	Basic Toxicology	3
Select at least two from the following:		5-8
A ST 456	Statistical Methods and Data Analysis	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
BCHE 341	Survey of Biochemistry	
E S 370	Environmental Soil Science	
EPWS 420	Environmental Behavior of Pesticides	
EPWS 451	Special Topics	
EPWS 481	Plant Nematology	
GEOG 381	Cartography and Geographic Information Systems	
SOIL 312	Soil Management and Fertility	
TOX 361	Basic Toxicology	
Total Credits		39-42

## Concentration: Pest Biology and Management

This option prepares you for careers such as insect, weed and disease management; in both field and urban environments, including IPM and Sustainable/Organic Techniques research technician; federal and state agencies; border security; agricultural consulting; and extension positions.

### Required Courses

CHEM 211	Organic Chemistry	4
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 481	Plant Nematology	3
or EPWS 462	Parasitology	
EPWS 492	Diagnosing Plant Disorders	3
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 110G	The Great Ideas of Physics	4
SOIL 252	Soils	3
SOIL 312	Soil Management and Fertility	3
TOX 361	Basic Toxicology	3
Select one from the following:		3
BIOL 312	Plant Taxonomy	
RGSC 357	Grass Taxonomy and Identification	
RGSC 316	Rangeland Plants	
Select 3 credits from the following:		3
EPWS 451	Special Topics	
EPWS 486	Plant Virology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
BIOL 301	Principles of Ecology	
RGSC 317	Rangeland Communities	
Total Credits		38

## Entomology - Undergraduate Minor

### Courses required for minor:

EPWS 302	General Entomology	4
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 303	Economic Entomology	3
or EPWS 475	Urban Entomology	
Choose from the following courses:		8
EPWS 100	Applied Biology	
EPWS 100 L	Applied Biology Lab	
EPWS 451	Special Topics	
EPWS 462	Parasitology	
Total Credits		18

## Pest Management - Undergraduate Minor

### Courses required for minor

EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4

### Choose from the following Courses: 6

EPWS 100	Applied Biology	
EPWS 100 L	Applied Biology Lab	
EPWS 303	Economic Entomology	
EPWS 451	Special Topics	
Upper-division EPWS course(s): (3-6 credits)		

Total Credits 18

## Plant Pathology - Undergraduate Minor

### Courses required for minor:

EPWS 310	Plant Pathology	4
EPWS 481	Plant Nematology	3
EPWS 486	Plant Virology	3

### Choose from the following Courses: 8

BIOL 311	General Microbiology	
BIOL 311 L	General Microbiology Laboratory	
EPWS 100	Applied Biology	
EPWS 100 L	Applied Biology Lab	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 492	Diagnosing Plant Disorders	

Total Credits 18

## Weed Science - Undergraduate Minor

### Courses required for minor:

EPWS 311	Introduction to Weed Science	4
EPWS 314	Plant Physiology	3
EPWS 449	Special Problems	1-3

### Choose from the following Courses: 8

EPWS 100	Applied Biology	
EPWS 100 L	Applied Biology Lab	
BIOL 312	Plant Taxonomy	
BIOL 408	Ecology of Plants	

Total Credits 16-18

## Agricultural Biology - Master of Science

There is currently a strong need for M.S. graduates trained in these areas, and the demand is expected to increase dramatically.

Students are prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Ph.D. programs. Specific career opportunities include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, industry research and environmental technicians.

The Master of Science degree program in Agricultural Biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound

protection of plants and animals from a wide and varied spectrum of pests.

## Family and Consumer Sciences

### Undergraduate Program Information

Courses and curricula in the department are designed to educate you as an individual and as a citizen in a changing society. They also develop a scientific attitude and the ability to conduct research directed toward solutions of problems affecting the quality of life for individuals, families and communities.

You must complete general education requirements, and a sequence of specialized course work is then identified for each major.

The following prefixes are used for courses:

- CTFM—Clothing, Textiles, and Fashion Merchandising;
- FCSC—Family and Consumer Sciences;
- FCS—Family and Child Science;
- FCSE—Family and Consumer Sciences Education;
- FSTE—Food Science and Technology;
- HNDS—Human Nutrition and Dietetic Sciences.

### Graduate Program Information

The candidate for the master's degree should have an undergraduate degree in a field related to the intended area of specialization. In addition to the Graduate School requirements, the admissions criteria for the Department of Family and Consumer Sciences Graduate Program include letters of reference, standardized test scores, and other materials. Suggested departmental deadlines for review of admission materials are six weeks prior to the first day of the semester of desired start. A complete description of admission requirements should be obtained from the department.

### Degrees for the Department

Clothing, Textiles and Fashion Merchandising - Bachelor of Science in Family and Consumer Sciences (p. 130)

Family and Child Science - Bachelor of Science in Family and Consumer Sciences (p. 131)

Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 132)

Food Science and Technology - Bachelor of Science in Food Science and Technology (p. 133)

Human Nutrition and Dietetic Sciences - Bachelor of Science in Family and Consumer Sciences (p. 134)

Family and Consumer Sciences - Master of Science (p. 136)

### Minors for the Department

Child Advocacy Studies (CAST) - Undergraduate Minor (p. 136)

Clothing, Textiles and Fashion Merchandising - Undergraduate Minor (p. 136)

Culinary Science - Undergraduate Minor (p. 136)

Family and Child Science - Undergraduate Minor (p. 136)

Food Science - Undergraduate Minor (p. 136)

Nutrition - Undergraduate Minor (p. 136)

**Professors** Devall, Munson-McGee; **Associate Professors** Bartley, Marin, Montanez; **Assistant Professor** Delgado, Rogus; **College Associate Professor** Vaillancourt

*S. Bartley, Ph.D. (Tennessee)– family studies; G. Blanch, Ph.D. (Claremont)– education; P. Bloomquist, Ph.D. (New Mexico State)– education management and development; E. Delgado, Ph.D. (Technical University of Berlin, Germany)– food science and technology; E. Devall, Ph.D. (Georgia)– child and family development; W. Fedio, Ph.D. (University of Alberta-Canada)– food microbiology; N. Flores, Ph.D. (Kansas State)– food science; W. Hamilton, Ed.D. (Montana State)– adult education and administration; J. Hertzman, Ph.D. (University of Nevada)– educational leadership; B. Jorgensen, Ph.D. (Virginia Tech)– family studies; S. Koukel, Ph.D. (Texas Tech)– family and consumer sciences education; K. Mandabach, Ed.D. (Houston)– higher education cultural and historical studies; M. Marin, Ph.D. (New Mexico State)– counseling and educational psychology; M. Montanez, Ph.D. (Michigan State)– psychology; S.H. Munson-McGee, Ph.D. (University of Delaware)– food processing and engineering; S. Rogus, Ph.D. (New York University)– nutrition and food studies; B. Stringam, Ph.D. (University of Northern Arizona)– education; K. Vaillancourt, Ph.D. (Virginia Tech)– family studies*

### Child Advocacy Studies Courses

#### CAST 201. Introduction to Child Advocacy

##### 3 Credits

This is the introductory course for child advocacy studies (CAST). It covers different models for understanding child maltreatment, types and indicators of child maltreatment, controversial topics in the field, and issues and laws related to child maltreatment in various countries around the world. Students will develop critical thinking and analytical skills in assessing child maltreatment. Restricted to Dona Ana campus only.

#### CAST 202. Professional and Systems Responses to Child Maltreatment

##### 3 Credits

Course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; and current research and controversial issues affecting the field. Restricted to Dona Ana campus only.

**Prerequisite(s):** CAST 201.

#### CAST 203. Prevention, Trauma Informed Treatment and Advocacy

##### 3 Credits

The purpose of this course is to prepare students to recognize the effects of child maltreatment and apply interventions strategies for children and their families. Multidisciplinary approaches to prevention, advocacy and treatment of child maltreatment survivors will be presented and discussed. Topics include violence prevention research, interdisciplinary family programs, how to advocate for survivors of child abuse, case management, working with families, mental health service and controversial issues.

**Prerequisite(s):** CAST 201.

**CAST 301V. Introduction to Child Advocacy****3 Credits**

Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. Taught with MSW 590. Cannot receive credit for CAST 301 and MSW 590.

**CAST 302. Professional and Systems Responses to Child Maltreatment****3 Credits**

Course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; current research and controversial issues effecting the field. Students majoring in social work, criminal justice, education, sociology, psychology, nursing, and other areas will enhance their capacity to strengthen the safety net that protects children.

**Prerequisite(s):** CAST 301V.

**CAST 303. Prevention, Trauma Informed Treatment and Advocacy****3 Credits**

The purpose of this course is to prepare students to recognize the effects of child maltreatment and to apply intervention strategies for children and their families. Multidisciplinary approaches to prevention, advocacy, and treatment of child maltreatment survivors will be presented and discussed. Topics include violence prevention research, interdisciplinary family programs, how to advocate for survivors of child abuse, short- and long-term effects of child abuse, case management, working with families, mental health services and controversial issues. Crosslisted with: FCS 300

**Prerequisite(s):** CAST 301V.

**CAST 501. Introduction to Child Advocacy****3 Credits**

This is the introductory course for child advocacy studies (CAST). It covers different models for understanding child maltreatment, types and indicators of child maltreatment, controversial topics in the field, and issues and laws related to child maltreatment in various countries around the world. Students will develop critical thinking and analytical skills in assessing child maltreatment at the graduate level.

**CAST 502. Professional and Systems Responses to Child Maltreatment****3 Credits**

This graduate level course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; and current research and controversial issues affecting the field.

**CAST 503. Prevention, Trauma Informed Treatment and Advocacy****3 Credits**

The purpose of this course is to prepare graduate students to recognize the effects of child maltreatment and apply interventions strategies for children and their families. Multidisciplinary approaches to prevention, advocacy and treatment of child maltreatment survivors will be presented and discussed.

**Prerequisite(s):** A "B" or better in CAST 501.

## Clothing, Textiles and Fashion Merchandising Courses

**CTFM 178. Fundamentals of Fashion****3 Credits**

Survey of the fashion business from fiber to end product.

**CTFM 202. Fashion Practicum****1-3 Credits (1-3)**

Applied field experience in the related areas of apparel design, fashion merchandising, and textile science. May be repeated up to 3 credits.

Restricted to: CTFM majors. Restricted to Las Cruces campus only.

**CTFM 270. Fashion Illustration****3 Credits (1+4P)**

Human figure sketches and fashion illustration as a form of communication. Emphasis on color, proportion, cut, and fabric detail.

**Prerequisites:** ART 110G.

**CTFM 273. Concepts in Apparel Construction****3 Credits (1+4P)**

Application of generalizations and principles of garment construction to varied fabrics and designs. Analysis and evaluation of apparel merchandise with emphasis on the quality of garment construction.

Restricted to: Main campus only. Restricted to CTFM, FCSE majors.

**CTFM 289. Fashion Studio I****3 Credits**

Applied principles in the criteria of pattern making: flat pattern and draping techniques. Projects will require three dimensional approaches in apparel design. Restricted to: CTFM majors. Restricted to Las Cruces campus only.

**CTFM 300. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. Restricted to Las Cruces campus only.

**Prerequisite(s):** CTFM 178; CTFM 270.

**CTFM 366. Historic Fashion****3 Credits**

The study of clothing styles from 3500 BC through the 20th century.

Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 255 and CTFM 270.

**CTFM 371. Textile Science****3 Credits (1+4P)**

Study of fabrics used for modern clothing, furnishings, and miscellaneous end uses. Textiles testing procedures explored.

**Prerequisites:** CHEM 110G or consent of instructor.

**CTFM 372. Fashion Merchandising****3 Credits**

The apparel industry from designing through manufacturing and distribution to retailers.

**Prerequisites:** CTFM 178.

**CTFM 373. Advanced Apparel Techniques****3 Credits**

This course builds upon concepts introduced in Concepts in Apparel Construction. An in-depth study of fabric selection, advanced garment construction and tailoring. New technologies applied to sewing construction will be explored. The use of computerized sewing machines will be incorporated. Restricted to CTFM majors.

**Prerequisite(s):** CTFM 255 and CTFM 273.

**CTFM 374. The Production of Textile and Fashion Accessories****3 Credits**

The production of textiles and fashion accessories for retail. Merchandising techniques for wholesale and retail companies. Consent of Instructor required. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 178 and CTFM 270.

**CTFM 384. Clothing for Special Needs****3 Credits**

Selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as for active sportswear, the handicapped, the elderly, and various specialty populations.

**Prerequisite:** consent of instructor.

**CTFM 402. Field Experience Marketing Training****1-3 Credits (1-3)**

Practical experience in clothing manufacturing or retailing. Supervised by resident faculty and supervisor at the work site. Report required. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CTFM majors.

**CTFM 460. Cultural Perspectives in Dress****3 Credits**

Explores the social, psychological and cultural aspects of dress and appearance which includes the relationship of dress to physical and social environments, aesthetic and personal expression and cultural ideas and values.

**Prerequisite(s):** CTFM 255 and CTFM 366.

**CTFM 474. Fashion Promotion****3 Credits**

This class focuses on the comprehensive nature of promotion in the merchandising environment of fashion related goods. Consent of Instructor required. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 255 and CTFM 372.

**CTFM 475. Fashion Buying****3 Credits**

Fundamental principles and procedures for successful merchandising of fashion goods, responsibilities of buyers, fashion trends, consumer demands, and merchandising arithmetic.

**Prerequisites:** ACCT 221, CTFM 372, and CTFM 474.

**CTFM 476. Apparel Design by Draping and Pattern Drafting****3 Credits (1+4P)**

Theory and application of draping and drafting garment patterns (required lab). Consent of Instructor required. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 255, CTFM 270 CTFM 273, and CTFM 373.

**CTFM 492. Special Problems****1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

**CTFM 571. Textile Science****3 Credits (1+4P)**

Fabrics used for modern clothing, furnishings, and miscellaneous end uses. Explores textiles testing procedures. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for CTFM 371.

**Prerequisite:** CHEM 110G or consent of instructor.

**CTFM 572. Fashion Merchandising****3 Credits**

Covers the apparel industry from designing through manufacturing and distribution to retailers. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for CTFM 372.

**Prerequisites:** CTFM 178 or consent of instructor.

**CTFM 584. Graduate Study in Clothing for Special Needs****3 Credits (1+4P)**

Graduate study in the selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as active sportswear, handicapped, elderly, and various specialty populations.

**Prerequisites:** CTFM 476.

**CTFM 598. Special Research Programs****1-4 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

## Family and Child Science Courses

**FCS 181. Interpersonal Skills in Intimate Relationships****3 Credits**

Developing social skills within friendships, dating relationships, marriage, parenting, and families. May be repeated up to 3 credits. Restricted to Las Cruces and Dona Ana campuses.

**FCS 210. Infancy and Early Childhood in the Family****3 Credits**

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age five. Attitudes, knowledge, and skills needed for working with young children and their families. Restricted to Las Cruces campus only.

**FCS 211. Middle Childhood Development in the Family****3 Credits**

Research and theory relevant to the physical, mental, social, and emotional development of the child from age five to age twelve. Attitudes, knowledge, and skills related to working with school-age children in the family system. Observation in a variety of settings may be required. Restricted to Las Cruces campus only.

**FCS 212. Adolescent Development and the Family****3 Credits**

Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required. Restricted to Las Cruces campus only.

**FCS 213. Adult Development and Aging****3 Credits**

Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions. Restricted to Las Cruces campus only.

**FCS 300. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**FCS 301. Personal and Family Finance****3 Credits**

Principles, processes and procedures involved in effective utilization and management of financial resources to meet the needs of individuals and/or families. Open to nonmajors.

**FCS 302. Consumer Practices and Problems for Families****3 Credits**

Consumer issues related to social, political, and economic components of the larger social system. Focuses on consumer rights and responsibilities within the marketplace.

**FCS 380. Family Dynamics****3 Credits**

The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.

**FCS 383. Parenting and Child Guidance****3 Credits**

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

**FCS 424. Field Experience: Issues and Ethics****4 Credits**

Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 8 credits must be taken. Consent of instructor required.

Restricted to: Main campus only. Restricted to FCS majors.

**Prerequisite(s):** FCS 380 or equivalent, junior standing, and an overall GPA of at least 2.5 and consent of instructor.

**FCS 449V. Family Ethnicities and Subcultures****3 Credits**

Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students.

**FCS 492. Special Problems****1-4 Credits**

Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits.

**FCS 510. Infancy and Early Childhood in the Family****3 Credits**

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families. May be repeated up to 3 credits.

**FCS 511. Middle Childhood Development in the Family****3 Credits**

Research and theory relevant to the physical, mental, and socio-emotional development of children from ages five to twelve. Attitudes, knowledge, and skills needed for working with school-age children and their families. May be repeated up to 3 credits.

**FCS 512. Adolescent Development and the Family****3 Credits**

Advanced study in research and theory relevant to the physical, mental, social, and emotional development of the child, ages 12-18. Attitudes, knowledge, and skills related to working with adolescents in the family system. May be repeated up to 3 credits.

**FCS 524. Supervised Practicum****1-9 Credits**

Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**FCS 525. Supervised Clinical Practice****1-9 Credits (2-18P)**

Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

**FCS 548. Adult Development and Aging****3 Credits**

Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions.

**FCS 549. Family Ethnicities and Subcultures****3 Credits**

Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCS 449V plus additional work.

**FCS 562. The Business and Practice of Marriage and Family Therapy****1 Credit**

This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. S/U Grading (S/U, Audit).

**FCS 572. Family Dysfunction and Diagnosis****3 Credits**

A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.

**Prerequisite(s):** Students must be enrolled in a clinical program (i.e. MFT, CEP, MSW).

**FCS 582. Theories of Marriage and Family Therapy****2 Credits**

A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research. May be repeated up to 4 credits.

**FCS 583. Parenting and Child Guidance****3 Credits**

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

**FCS 584. Family Law and Ethics****3 Credits**

Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

**FCS 585. The Family System****3 Credits**

Contemporary family interaction: concepts, composition, resource and environment.

**FCS 586. Sexuality and Family Dynamics****3 Credits**

Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

**FCS 587. Contemporary Marriage and Family Issues****3 Credits**

Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

**FCS 589. Family Crises and Rehabilitation****3 Credits**

Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

**FCS 590. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

**FCS 592. Strategies in Family Therapy****2 Credits**

Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers. May be repeated up to 4 credits.

**FCS 598. Special Research Programs****1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**FCS 599. Master's Thesis****15 Credits**

Thesis

## Family and Consumer Science Courses

**FCSC 400. Research Methods in Family and Consumer Sciences****3 Credits**

Introduction to research design and methodology in Family and Consumer Sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and perform basic skills including hypotheses development and conducting a literature search.

**FCSC 500. Research Methods****3 Credits**

This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

**FCSC 598. Special Research Programs****1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**FCSC 599. Master's Thesis****15 Credits**

May be repeated for unlimited credit, maximum of 6 credits toward a degree.

## Family and Consumer Science Education Courses

**FCSE 235. Housing and Interior Design****3 Credits**

Investigation of types of housing and factors impacting housing decisions for families. Selection, planning, and arrangement of interior components of homes to meet the needs of the family. Restricted to Las Cruces campus only.

**Prerequisite(s):** No prerequisites.

**FCSE 245. Overview of Family and Consumer Sciences Teaching****3 Credits**

Overview of planning and teaching skills. Supervised experiences in observing and directing the learning of secondary family and consumer sciences students. Philosophy and history of the profession.

**FCSE 345. Management Concepts in Family and Consumer Sciences Teaching****3 Credits**

Incorporation and application of management concepts in family and consumer sciences subject matter. Practical experience teaching management and ways to use management skills to plan, implement, and evaluate the teaching-learning transaction.

**FCSE 348. Teaching in Informal Family and Consumer Sciences Settings****3 Credits**

Learning principles and theories with application in informal family and consumer sciences education situations. Includes supervised experience in use of teaching strategies.

**Prerequisite:** overall GPA of at least 2.5 or consent of instructor.

**FCSE 445. Career and Technical Education Programs****3 Credits**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

**FCSE 446. Teaching Methods I for Family and Consumer Sciences****3 Credits**

Objectives, content, and organization of family and consumer sciences curriculum in high schools; materials and methods of teaching. Restricted to majors.

**Prerequisites:** FCSE 245 and FCSE 345 and an overall GPA of at least 2.5, or consent of instructor.

**FCSE 447. Teaching Methods II for Family and Consumer Sciences****3 Credits**

Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Preparation for employment.

Restricted to majors.

**Prerequisites:** FCSE 245, FCSE 345, FCSE 445, FCSE 446 and an overall GPA of at least 2.5, or consent of instructor.

**FCSE 448. Supervised Teaching in Family and Consumer Sciences****12 Credits**

Seventy (70) days of full-time supervised teaching in selected high schools. Consent of Instructor required. Restricted to: FCSE majors.

**Prerequisite(s):** FCSE 446, an overall GPA of at least 2.5, and consent of instructor.

**FCSE 492. Special Problems****1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

**FCSE 545. Graduate Study in Vocational Programs for Youth and Adults**  
**3 Credits**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

**FCSE 546. Graduate Study in Teaching Methods I**  
**3 Credits**

Objectives, content, and organization of family and consumer sciences in high schools; materials and methods of teaching. Additional assignments beyond FCSE 446 required for students registering in FCSE 546.

**FCSE 547. Graduate Study in Teaching Methods II**  
**3 Credits**

Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Additional assignments beyond FCSE 447 required for students registering in FCSE 547.

**FCSE 548. Graduate Study in Supervised Teaching in Family and Consumer Sciences**  
**12 Credits**

Seventy of full-time, supervised teaching in selected schools. Additional assignments beyond FCSE 448 required for students registering in FCSE 548. Consent of Instructor required.

**Prerequisite(s):** FCSE 446 or FCSE 546, and consent of instructor.

**FCSE 590. Special Topics**  
**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

## Food Science and Technology Courses

**FSTE 164G. Introduction to Food Science and Technology**  
**4 Credits (3+2P)**

An introductory course in the scientific study of the nature and composition of foods and their behavior during all aspects of their conversion from raw materials to consumer food products.

**FSTE 175. ACES in the Hole Foods I**  
**4 Credits**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products Restricted to Las Cruces campus only.

**Prerequisite(s):** Students enrolled in this class must possess A Food Handler Card.

**FSTE 200. Special Topics**  
**1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**FSTE 210G. Survey of Food and Agricultural Issues**  
**3 Credits**

Same as AG E 210G.

**FSTE 263G. Food Science I**  
**4 Credits (3+2P)**

The scientific study of the principles involved in the preparation and evaluation of foods. May be repeated up to 4 credits.

**FSTE 275. ACES in the Hole Foods II**  
**4 Credits**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. May be repeated up to 4 credits.

**Prerequisite(s):** FSTE 175 and Have a Food Handler Card.

**FSTE 320. Food Microbiology**  
**4 Credits (3+2P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. May be repeated up to 4 credits.

**Prerequisite(s):** (BIOL 111G and BIOL 111GL), or (BIOL 211G and BIOL 211GL), or consent of instructor.

**FSTE 325. Food Analysis**  
**3 Credits (2+2P)**

Basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 111G or consent of instructor.

**FSTE 328. Introduction to Food Engineering**  
**3 Credits (2+2P)**

Basic engineering principles including mass and energy balances, fluid flow, heat transfer and chemical kinetics and their application to food processing unit operations. Video and laboratory participation are used to enhance course content and relevance. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 142G or consent of instructor.

**FSTE 331. Food Preservation**  
**3 Credits (2+2P)**

Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. May be repeated up to 3 credits.

**Prerequisite(s):** FSTE 263G.

**FSTE 375. ACES in the Hole Foods III**  
**4 Credits (2+8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products May be repeated up to 8 credits. Restricted to: FSTE majors.

**Prerequisite(s):** FSTE 275 and Have a Food Handler Card.

**FSTE 421. Food Chemistry**  
**3 Credits**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing, and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods.

**Prerequisites:** CHEM 111G, CHEM 112G, and CHEM 211, or consent of instructor.

**FSTE 423. Food Processing Technologies****4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control.

Application of principles to processing food in a laboratory setting.

**Prerequisite(s):** FSTE 328.

**FSTE 425. Sensory Evaluation of Foods****3 Credits (2+2P)**

Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.

**Prerequisite(s):** FSTE 263G and A ST 311 or STAT 251.

**FSTE 429. Product Development****3 Credits (1+4P)**

Application of chemical, physical, nutritional and psychological principles and experimental methods to the development and evaluation of a food product for a specified food product development competition.

**Prerequisite(s):** FSTE 320 and FSTE 425.

**FSTE 430. Designing and Brewing Great Beers of the World****3 Credits (1+4P)**

The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class. May be repeated up to 3 credits.

**FSTE 450. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

**FSTE 475. ACES in the Hole Foods IV****1-4 Credits (2-8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. May be repeated up to 8 credits. Restricted to: FSTE majors.

**Prerequisite(s):** FSTE 375 Have a Food Handler Card.

**FSTE 492. Special Problems****1-4 Credits**

Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

**FSTE 500. Data Analysis for Food Scientists****3 Credits (3)**

An introduction to data analysis of food scientists. Modern statistical techniques used to analyze typical data collected by food scientists and researchers will be covered. Consent of Instructor required.

**FSTE 520. Graduate Study in Food Microbiology****3 Credits (2+3P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.

**Prerequisites:** BIOL 111G/111GL, or BIOL 211G/211GL, or consent of instructor.

**FSTE 521. Graduate Study in Food Chemistry****3 Credits**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.

**Prerequisites:** CHEM 111G, CHEM 112G, and CHEM 211, or consent of instructor.

**FSTE 523. Food Processing Technologies****4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting.

Additional work beyond that for FSTE 423 required at the graduate level.

**Prerequisite(s):** FSTE 528.

**FSTE 524. Sensory Evaluation of Foods****3 Credits (2+3P)**

Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.

**Prerequisite(s):** FSTE 263G and A ST 311 or STAT 251.

**FSTE 525. Graduate Study in Food Analysis****3 Credits (2+3P)**

Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.

**Prerequisite(s):** CHEM 111G or consent of instructor.

**FSTE 532. Designing and Brewing Great Beers of the World****3 Credits (2+2P)**

The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

**FSTE 560. Rumen Microbiology (so)****3 Credits**

Same as ANSC 560.

**FSTE 575. ACES in the Hole Foods****1-4 Credits (2-8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. May be repeated up to 8 credits.

**Prerequisite(s):** Students must possess a food handler card.

**FSTE 598. Special Research Programs****1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

## Human Nutrition and Diet Courses

**HNDS 201. Seminar I- The Field of Dietetics****1 Credit**

This course will introduce students to the field experience, careers, and professions in nutrition. This course is required for students pursuing a Didactic Program in Dietetics verification statement. May be repeated up to 1 credit. Consent of Instructor required. Restricted to: HNDS majors. Restricted to Las Cruces and Dona Ana campuses.

**HNDS 251. Human Nutrition****3 Credits**

Principles of normal nutrition. Relation of nutrition to health. Course contains greater amounts of chemistry and biology than HNDS 163. Open to nonmajors.

**HNDS 300. Special Topics****1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**HNDS 350. Nutrition Throughout the Lifecycle****3 Credits**

Relationship of the stages of the human life cycle to changes in nutrient need.

**Prerequisites:** (BIOL 254 or BIOL 226 or SP M 371) and HNDS 251, or consent of instructor.

**HNDS 360. Food for Health****4 Credits**

This course is designed to provide students the opportunity to learn about the intersection of nutrition and health in terms of food and diet. Students will be introduced to basic concepts within nutrition education, nutrition communication, nutrition and health and food culture.

**Prerequisite(s):** FSTE 263; HNDS 251.

**HNDS 363. Quantity Food Production and Service****6 Credits (1+10P)**

Covers quantity food production including cooking concepts, sanitation and safety, teamwork, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe or NM Food Handler certification required. May be repeated up to 6 credits. Crosslisted with: HRTM 363.

**Prerequisite(s):** HRTM 263.

**HNDS 401. Field Experience- Clinical Dietetics****1-8 Credits (1-8)**

Experience in various areas of clinical nutrition facilities with emphasis on nutrition care of patients. Practical experience with supervision by resident faculty as well as supervisor at work site. Performance at work site graded in accordance with university standards. May be repeated for a maximum of 8 credits. Consent of instructor required. Restricted to: Main campus only.

**Prerequisite(s):** HNDS 201, overall GPA of 2.5 or higher and junior or senior standing and consent of instructor.

**HNDS 403. Community Nutrition****3 Credits**

Overview of the practice of community nutrition. Includes program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community.

**Prerequisite:** HNDS 350 or consent of instructor.

**HNDS 405. Seminar II- Entering the Field of Dietetics****1 Credit**

Students will develop professional materials that will be used in their future careers including a personal statement, curriculum vitae, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered. Consent of Instructor required. Crosslisted with: HNDS 505. Restricted to: HNDS majors.

**Prerequisite(s):** Students must be enrolled in their last fall semester prior to planned graduation from the DPD program; HNDS 201, HNDS, 251, HNDS 350.

**Corequisite(s):** HNDS 403, HNDS 446, AND HNDS 448.

**HNDS 407. Field Experience Community Nutrition****1-8 Credits**

Experience working with nutritional problems of individual families of all socioeconomic and age levels and with agencies concerned with community nutrition. Practical experience with supervision by resident faculty as well as supervisor at the work site. Performance at work site graded in accordance with university standards. May be repeated for a maximum of 8 credits. Restricted to majors.

**Prerequisites:** HNDS 201, overall GPA of at least 2.5 and junior or senior standing or consent of instructor.

**HNDS 409. Dietetic Science Capstone****3 Credits**

This course will provide a cumulative review and assessment of the foundational knowledge, concepts, and skills presented throughout the didactic program in nutrition and dietetics to ensure readiness to proceed within the field of dietetics. Students will apply professional skills to prepare them for their future careers. Students will also be guided through the dietetic internship application process. Consent of Instructor required. Crosslisted with: HNDS 509. Restricted to: Dietetics Option majors.

**Prerequisite(s):** Students must be enrolled in their last spring semester prior to planned graduation from the DPD program.

**HNDS 410. Sports Nutrition****3 Credits**

Role of nutrition in physical performance of competitive and recreational sports participants.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 420. Nutrition Counseling and Communication****3 Credits**

This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education. Consent of Instructor required.

**Prerequisite(s):** HNDS 251, HNDS 350.

**HNDS 430. Food Service Organization and Management****3 Credits**

Personnel, financial and general management in institutional and commercial food service operations.

**Prerequisite:** junior/senior standing or consent of instructor.

**HNDS 440. Nutrition Education and Research****3 Credits**

Course will enable students to apply general education and research knowledge to the field of nutrition. Nutrition information will be applied to education topics including learning objective development, backwards design of curriculum, student centered learning and learning assessment. Crosslisted with: HNDS 540.

**Prerequisite(s)/Corequisite(s):** HNDS 251, 350, and 360.

**HNDS 446. Diet Therapy I****3 Credits**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 446 L. Diet Therapy I Laboratory****1 Credit**

Supplements HNDS 446. Students will perform nutrition assessments, nutrition focused physical exams, apply medical nutrition therapy-based interventions and practice patient discharge education for specific disease states. Must be taken with HNDS446. Restricted to: HNDS majors.

**Corequisite(s):** HNDS 446.

**HNDS 448. Advanced Nutrition****3 Credits**

Application of biochemistry and physiology to nutrition. Restricted to: Main campus only.

**Prerequisite(s):** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 449. Diet Therapy II****3 Credits**

Continuation of HNDS 446.

**Prerequisite:** HNDS 446 or consent of instructor.

**HNDS 449 L. Diet Therapy II Laboratory****1 Credit**

Supplements HNDS 449. Students will apply medical nutrition therapy to specific disease states with special emphasis on writing nutrition support orders and learning to utilize nutrition support equipment. Must be taken with HNDS449. Restricted to: HNDS majors.

**Corequisite(s):** HNDS 449.

**HNDS 450. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**HNDS 455. Billing and Coding for Dietetics****3 Credits**

This course provides students with an overview of billing and coding practices for medical nutrition therapy that ensure proper reimbursement for services. Students will learn nutrition related billing codes, apply nutrition care process terminology to documentation, and discover how policy affects current and future coverage of nutrition services. Crosslisted with: HNDS 555.

**Prerequisite(s):** HNDS 446, HNDS 449.

**HNDS 492. Special Problems****1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits.

**HNDS 500. Orientation to Dietetic Internship****3 Credits**

Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship program.

**HNDS 501. Advanced Animal Nutrition (so)****3 Credits**

Same as ANSC 501.

**HNDS 507. Laboratory Techniques in Nutrition****4 Credits (2+6P)**

Methodology and experimental procedures in measuring nutrient requirements and values of diets. Same as ANSC 507.

**Prerequisites:** ANSC 422 or consent of instructor.

**HNDS 509. Dietetic Science Capstone****3 Credits**

This course will provide a cumulative review and assessment of the foundational knowledge, concepts, and skills presented throughout the didactic program in nutrition and dietetics to ensure readiness to proceed within the field of dietetics. Students will apply professional skills to prepare them for their future careers. Students will also be guided through the dietetic internship application process. Consent of Instructor required. Crosslisted with: HNDS 409.

**Prerequisite(s):** Students must be enrolled in their last semester of the DPD program.

**HNDS 510. Graduate Study in Sports Nutrition****3 Credits**

Role of nutrition and nutrients in physical performance of competitive and recreational sports participants. Additional work required at the graduate level.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 512. Research Methods in Animal Science****4 Credits**

Same as ANSC 512.

**HNDS 517. Graduate Seminar****1 Credit**

Current topics. Same as ANSC 515.

**Prerequisite:** consent of instructor.

**HNDS 522. Animal Nutrition (f)****3 Credits**

Same as ANSC 522.

**HNDS 530. Graduate Studies in Food Service Organization and Management****3 Credits**

Personnel, financial, and general management in institutional and commercial food service operations. Additional work required at the graduate level.

**HNDS 546. Diet Therapy I****3 Credits**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond HNFS 446 required for students registering in HNDS 546.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 548. Graduate Studies in Advanced Nutrition****3 Credits**

Covers biochemistry and physiology applied to nutrition. Students enrolled in the 500-level class will be required to complete additional assignments beyond what is required for HNDS 448. Restricted to: Main campus only.

**HNDS 549. Diet Therapy II****3 Credits**

Continuation of HNDS 546.

**Prerequisites:** HNDS 546 or consent of instructor.

**HNDS 551. Graduate Study in Community Nutrition****3 Credits**

Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Additional work required at the graduate level.

**Prerequisite:** HNDS 350 or consent of instructor.

**HNDS 560. Dietetic Intern Seminar****1 Credit**

Portfolio development for dietetic interns during supervised practice rotations. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Acceptance into the NMSU dietetic internship.

**HNDS 562. Dietetic Internship: Supervised Practice in Community Nutrition****1-8 Credits (2-6P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in community nutrition to include an emphasis in Cooperative Extension Service. Dietetic interns work under the the guidance of faculty and community nutrition professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNFS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 563. Community Nutrition for Dietetic Interns****3 Credits**

Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. Consent of instructor required. Restricted to HNDS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 564. Dietetic Internship: Supervised Practice in Food Service Management****1-5 Credits (2-10P)**

Provides dietetic interns with a minimum of 300 clock hours of supervised practice in foodservice management. Dietetic interns work under the guidance of faculty and foodservice management professionals. Students must complete a total of 4 credit hours of HNDS 564. May be repeated up to 5 credits. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 565. Foodservice Management for Dietetic Interns****3 Credits**

Advanced topics in foodservice systems management to include business planning and marketing. Consent of Instructor required.

Restricted to: HNFS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 566. Dietetic Internship: Supervised Practice in Clinical Dietetics****1-8 Credits (2-16P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. May be repeated up to 8 credits. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 567. Nutrition Care Process for Dietetic Interns****3 Credits**

Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of instructor required.

Restricted to HNDS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 568. Review Course for National RD Exam****3 Credits**

Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 590. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

**HNDS 598. Special Research Programs****1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**HNDS 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)****4 Credits**

Same as ANSC 626.

**Phone:** (575) 646-3936

**Website:** <http://aces.nmsu.edu/academics/FCS/>

## **Clothing, Textiles and Fashion Merchandising - Bachelor of Science in Family and Consumer Sciences**

The Clothing, Textiles and Fashion Merchandising major prepares students to achieve career goals in the diverse field of fashion merchandising and apparel design. Students are prepared with courses in fashion merchandising, marketing, retail management, textiles and apparel design. With knowledge and skills attained from the academic preparation, graduates can compete in today's fashion industry. Skills attained in garment construction, draping and flat pattern allow for additional technical and costing abilities to meet the creative environment of the fashion industry. A GPA of 2.5 or better is required to enroll in CTFM 402 Field Experience Marketing Training to complete the degree requirements.

## General Education Requirements

A list of specific general education requirements is available in the department. Please check with your advisor.

### Departmental Requirements

CTFM 178	Fundamentals of Fashion	3
CTFM 270	Fashion Illustration	3
CTFM 273	Concepts in Apparel Construction	3
CTFM 366	Historic Fashion	3
CTFM 371	Textile Science	3
CTFM 372	Fashion Merchandising	3
CTFM 373	Advanced Apparel Techniques	3
CTFM 374	The Production of Textile and Fashion Accessories	3
CTFM 384	Clothing for Special Needs	3
CTFM 402	Field Experience Marketing Training	1-3
CTFM 460	Cultural Perspectives in Dress	3
CTFM 474	Fashion Promotion	3
CTFM 475	Fashion Buying	3
CTFM 476	Apparel Design by Draping and Pattern Drafting	3
Select six 300 or 400 level credits from FCS, FCSE or FRMG prefixes		6

### Nondepartmental Requirements

A ST 311 or STAT 251G	Statistical Applications Statistics for Business and the Behavioral Sciences	3
ACCT 222 or ACCT 221	Principles of Accounting II (Managerial) Principles of Accounting I (Financial)	3
ART 110G	Visual Concepts	3
CHEM 110G or One general education course from the approved list	Principles and Applications of Chemistry	4
ECON 252G	Principles of Microeconomics	3
ENGL 111G	Rhetoric and Composition	4
MATH 120	Intermediate Algebra	3
MATH 210G	Mathematics Appreciation	3
MGT 309 or MGT 315V	Human Behavior in Organizations (or) Human Relations in Organizations	3
MGT 315V	Human Relations in Organizations	3
PSY 201G	Introduction to Psychology	3
SOC 101G	Introductory Sociology	3
General Education HIST Course		3
Viewing a Wider World		6

Select one from the following:		3
MKTG 303	Principles of Marketing	
MKTG 313	Retail Management	
MKTG 324	Product/Service Development	

Select one from the following:		3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	

Select one from the following:		3
AG E 250	Technology and Communication for Business Management	
BCIS 110	Fundamentals of Information Literacy and Systems	
C S 110	Computer Literacy	

Select one from the following:		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	

### Electives

Select credits in consultation with CTFM advisor to round out curriculum of 120 credits. <sup>1</sup>

Courses recommended by advisor.

#### Recommended Electives

MGT 332	Human Resources Management	
MGT 453	Leadership and Motivation	
MKTG 317	International Marketing	

**Total Credits** 128

<sup>1</sup> At least 48 credits must be courses labeled 300 or above. Check prerequisites before enrolling in courses.

## Family and Child Science - Bachelor of Science in Family and Consumer Sciences

This major stresses the interrelationship of individuals across the life span and the impact of social and economic factors on the family system. Graduates are prepared for professional work with social and community agencies and other programs serving families. This degree program has been deemed a CFLE-approved academic program by the National Council on Family Relations' Certified Family Life Educator program so that you can apply through the abbreviated application process to become a CFLE upon graduation. You must work closely with an advisor. You must achieve a grade of C- or higher in your required core and minor courses, and must retake required courses with a grade lower than C-. You must have a GPA of 2.5 or higher before enrolling in

FCS 424	Field Experience: Issues and Ethics	4
FCSC 400	Research Methods in Family and Consumer Sciences	3

FCSE 348 Teaching in Informal Family and Consumer Sciences Settings

3 that you have learned in a semester of student teaching in a selected school. Requirements for admission to the student teaching component of the Family and Consumer Sciences Education are

## General Education Requirements

A list of specific general education requirements is available in the department. Please check with your advisor.

### Departmental Requirements

CAST 301V	Introduction to Child Advocacy	3
CAST 302	Professional and Systems Responses to Child Maltreatment	3
CAST 303	Prevention, Trauma Informed Treatment and Advocacy	3
FCS 181	Interpersonal Skills in Intimate Relationships	3
FCS 210	Infancy and Early Childhood in the Family	3
FCS 211	Middle Childhood Development in the Family	3
FCS 212	Adolescent Development and the Family	3
FCS 213	Adult Development and Aging	3
FCS 301	Personal and Family Finance	3
FCS 302	Consumer Practices and Problems for Families	3
FCS 380	Family Dynamics	3
FCS 383	Parenting and Child Guidance	3
FCS 424	Field Experience: Issues and Ethics	4
FCS 449V	Family Ethnicities and Subcultures	3
FCSC 400	Research Methods in Family and Consumer Sciences	3
FCSE 345	Management Concepts in Family and Consumer Sciences Teaching	3
or FCSE 348	Teaching in Informal Family and Consumer Sciences Settings	
HNDS 251	Human Nutrition	3
or PHLS 150G	Personal Health and Wellness	

### Minor Courses

Select 9-18 credits with the approval of an FCS advisor from a minor related to the FCS field such as CAST, C EP, ECED, GERO, PHLS, PSY, SOC, S WK and W S. 9-18

### Electives

Select electives with approval of an FCS advisor sufficient to bring total to at least 120 credits. <sup>1</sup> 50

Total Credits 111-120

<sup>1</sup> At least 48 credits must be courses labeled 300 or above.

## Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences

This major prepares you to teach in middle or high school or in other settings such as the Cooperative Extension Service or community agencies. The major is an accredited education program which meets the teacher licensure requirements for the State of New Mexico. In the spring semester of the senior year, you will apply all the principles of teaching

1. an overall grade-point average of 2.5 or higher, and a grade-point average of 2.5 or higher in family and consumer sciences courses;
2. a C or better in all departmental courses; and
3. recommendation of the advisor.

You must have a GPA of 2.5 or higher before enrolling in the following FCSE courses:

FCSE 446	Teaching Methods I for Family and Consumer Sciences	3
FCSE 447	Teaching Methods II for Family and Consumer Sciences	3
FCSE 448	Supervised Teaching in Family and Consumer Sciences	12

## Requirements

A list of specific requirements is available in the department. Please check with your advisor.

### Departmental Requirements

CTFM 178	Fundamentals of Fashion	3
CTFM 273	Concepts in Apparel Construction	3
CTFM 371	Textile Science	3
FCS 181	Interpersonal Skills in Intimate Relationships	3
FCS 210	Infancy and Early Childhood in the Family	3
FCS 212	Adolescent Development and the Family	3
FCS 301	Personal and Family Finance	3
FCS 302	Consumer Practices and Problems for Families	3
FCS 380	Family Dynamics	3
FCS 383	Parenting and Child Guidance	3
FCSE 235	Housing and Interior Design	3
FCSE 245	Overview of Family and Consumer Sciences Teaching	3
FCSE 345	Management Concepts in Family and Consumer Sciences Teaching	3
FCSE 445	Career and Technical Education Programs	3
FCSE 446	Teaching Methods I for Family and Consumer Sciences	3
FCSE 447	Teaching Methods II for Family and Consumer Sciences	3
FSTE 164G	Introduction to Food Science and Technology	4
FSTE 263G	Food Science I	4
FSTE food science 300+ elective (see advisor for selections)		3
HNDS 251	Human Nutrition	3
HNDS nutrition 300+ elective (see advisor for selections)		3
<b>Nondepartmental Requirements</b>		
HRTM 221	Introduction to Hospitality Management	3
HRTM 231	Safety, Sanitation and Health in the Hospitality Industry	2

HRTM 363	Quantity Food Production and Service	6
Select one from the following:		3
AG E 250	Technology and Communication for Business Management	
C S 110	Computer Literacy	
BCIS 110	Fundamentals of Information Literacy and Systems	
<b>Viewing a Wider World</b>		
Select two from the following:		6
PHLS 301V	Human Sexuality	
BLAW 385V	Consumers and the Law	
MKTG 311V	Consumer Behavior	
One approved VWW Course		
<b>Specific Teaching Requirements</b>		
FCSE 448	Supervised Teaching in Family and Consumer Sciences	12
SPED 350	Introduction to Special Education in a Diverse Society	3
RDG 414	Content Area Literacy	3
Total Credits		103

## Food Science and Technology - Bachelor of Science in Food Science and Technology

Students in this major study diverse scientific disciplines including chemistry, microbiology, nutrition and engineering. These principles from these disciplines are then applied to the industrial and practical aspects of product development, food processing, quality control/quality assurance, food preservation and sensory evaluation of foods. Background courses are required in English, communication, biology, chemistry, and core food science and technology. Necessary courses cover production, preparation, analysis, safety, nutritional and aesthetic principles. This provides students with a solid background to understand the nature, deterioration and processing of foods. These critical thinking, analytical, and application skills are necessary to translate those principles into the selection, processing, preservation, packaging, distribution and use of a safe, adequate, and high-quality food supply. Concentration areas in science, engineering and technology, culinary science and meat science allow students to focus on an area of interest.

You must achieve a grade of C- or higher in all classes with CHEM, BCHE, BIOL, FSTE or HNDS prefixes.

## Requirements

### Basic Science and Background Requirements

BCHE 341	Survey of Biochemistry	4
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4

ENGL 111G	Rhetoric and Composition	4
MATH 142G	Calculus for the Biological and Management Sciences	3
Select at least 15 credits from Humanities and Fine Arts and Social/Behavioral Sciences General Education Requirements, with at least 6 credits from each category:		15
Select 6-9 credits from Humanities and Fine Arts		
Select 6-9 credits from Social/Behavioral Sciences		
ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	
A ST 311	Statistical Applications	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
Select one from the following:		3
AG E 250	Technology and Communication for Business Management	
BCIS 110	Fundamentals of Information Literacy and Systems	
C S 110	Computer Literacy	
Select one from the following:		3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	

### Food Science and Technology Core Requirements

ANSC 262	Introduction to Meat Science	3
FSTE 164G	Introduction to Food Science and Technology	4
FSTE 210G	Survey of Food and Agricultural Issues	3
FSTE 263G	Food Science I	4
FSTE 320	Food Microbiology	4
FSTE 325	Food Analysis	3
FSTE 328	Introduction to Food Engineering	3
FSTE 331	Food Preservation	3
FSTE 421	Food Chemistry	3
FSTE 423	Food Processing Technologies	4
FSTE 425	Sensory Evaluation of Foods	3
FSTE 429	Product Development <sup>1</sup>	3
HNDS 251	Human Nutrition	3

### Options

Select one from the following options:		19-26
Culinary Science		
Meat Science		
Science, Technology and Engineering		

Total Credits	121-128
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<sup>1</sup> FSTE majors must take FSTE 429 Product Development for 3 credits.

## Concentration: Culinary Science

### Required Courses

ANTH 360V	Food and Culture Around the World	3
HRTM 231	Safety, Sanitation and Health in the Hospitality Industry	2

HRTM 263	Food Production and Service Fundamentals	3
HRTM 307	Professional Development	1
HRTM 363	Quantity Food Production and Service	6
HRTM 408	Hospitality Internship	1
HRTM 413	Restaurant Operations Management	4
HRTM 414	International Food and Wine	3
Viewing a Wider World		3
<b>Total Credits</b>		<b>26</b>

## Concentration: Meat Science

### Required Courses

ANSC 200	Introduction to Meat Animal Production	3
ANSC 301	Animal and Carcass Evaluation	3
ANSC 351V	Agricultural Animals of the World	3
ANSC 363	Meat Technology	3
PHYS 211G	General Physics I	3
PHYS 211GL	General Physics I Laboratory	1
Viewing a Wider World		3
<b>Total Credits</b>		<b>19</b>

## Concentration: Science, Technology and Engineering

### Required Courses

FSTE 175	ACES in the Hole Foods I <sup>2</sup>	4
FSTE 275	ACES in the Hole Foods II <sup>2</sup>	4
FSTE 375	ACES in the Hole Foods III <sup>2</sup>	4
FSTE 475	ACES in the Hole Foods IV <sup>2</sup>	4
PHYS 211G	General Physics I	3
PHYS 211GL	General Physics I Laboratory	1
Select two Viewing a Wider World courses		6
<b>Total Credits</b>		<b>26</b>

<sup>2</sup> FSTE majors with the Science, Technology, and Engineering option must take FSTE 175 ACES in the Hole Foods I, FSTE 275 ACES in the Hole Foods II, FSTE 375 ACES in the Hole Foods III and FSTE 475 ACES in the Hole Foods IV for 4 credits each (a total of 16 credits).

Students are encouraged to use the elective hours to complete a minor in a related area such as chemistry, microbiology, and business. Consult an advisor for requirements.

# Human Nutrition and Dietetic Sciences - Bachelor of Science in Family and Consumer Sciences

## Concentration: Nutrition Education

This option prepares students to become nutrition educators that work within the community and public health settings. This option focuses on health and wellness, the association between nutrition and health, and teaching healthy living. Graduates from the Nutrition Education option will have learned the skills to communicate evidence-based nutrition information, provide nutrition education, and blend nutrition with other health science subjects. The job opportunities for those graduating from this program include working as a nutrition educator or nutrition

assistant in county agencies, Extension Services, community nutrition programs, schools and with health organizations.

Unlike the Dietetics option, this option does **not** prepare students to pursue the credential of a Registered Dietitian.

## General Education Requirements

Areas I-III are incorporated into the Nutrition Education course list below. Students are able to select the five required courses from Areas IV-V and two required courses from the Viewing a Wider World (p. 46) section in the General Requirements (p. 46) section of the catalog. Please refer to the HNDS Undergraduate Student Handbook for a list of recommended courses to choose from in order to fulfill these requirements.

### Departmental Requirements

FCS 181	Interpersonal Skills in Intimate Relationships	3
FCSC 400	Research Methods in Family and Consumer Sciences	3
FCSE 245	Overview of Family and Consumer Sciences Teaching	3
FCSE 345	Management Concepts in Family and Consumer Sciences Teaching	3
FCSE 446	Teaching Methods I for Family and Consumer Sciences	3
FCSE 447	Teaching Methods II for Family and Consumer Sciences	3
FSTE 263G	Food Science I	4
FSTE 320	Food Microbiology	4
HNDS 201	Seminar 1- The Field of Dietetics	1
HNDS 251	Human Nutrition	3
HNDS 350	Nutrition Throughout the Lifecycle	3
HNDS 363	Quantity Food Production and Service	6
HNDS 403	Community Nutrition	3
HNDS 407	Field Experience Community Nutrition	1-8
HNDS 420	Nutrition Counseling and Communication	3
HRTM 263	Food Production and Service Fundamentals	3

### Nondepartmental Requirements

ENGL 111G	Rhetoric and Composition	4
Select one from the following:		3
ENGL 203G	Business and Professional Communication	
ENGL 218G	Technical and Scientific Communication	
ENGL 318G	Advanced Technical and Professional Communication	
Select one from the following:		3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
MATH 121G	College Algebra	3
or MATH 142G	Calculus for the Biological and Management Sciences	
BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1

PSY 201G	Introduction to Psychology	3
CHEM 111G	General Chemistry I	4
BIOL 225	Human Anatomy and Physiology I	4
BIOL 226	Human Anatomy and Physiology II	4
PHLS 150G	Personal Health and Wellness	3
PHLS 275	Foundations of Health Education	3
PHLS 395	Foundations of Public Health	3
PHLS 459	Infectious and Noninfectious Disease Prevention	3
PHLS 461	Health Disparities: Determinants and Interventions	3
PHLS 464V	Cross-Cultural Aspects of Health	3
RDG 414	Content Area Literacy	3
Total Credits		102-109

## Viewing a Wider World

Refer to the "List of Recommended GE courses" for HNDS students in the HNDS Undergraduate Student Handbook for a list of field-related course options that can be selected from the GE Core Curriculum and Viewing a Wider World course requirements.

## Concentration: Pre-Dietetics/Dietetics

The Dietetics option prepares students to become registered dietitians (RD) and dietetic technicians, registered (DTR). This option encompasses nutritional science, clinical dietetics, community nutrition, food science and food service management.

All students enrolled in this option begin as Pre-Dietetics students.

**All Pre-Dietetics students are required to apply for admission into the Dietetics option in the fall semester of their junior year as indicated on the Pre-Dietetics/Dietetics road map.** Please refer to the HNDS Undergraduate Student Handbook for information on the admissions criteria, application instructions, and the application process. Pre-Dietetic students are termed Dietetic students upon formal notification of admission into the Dietetics program.

The Dietetics option is a Didactic Program in Dietetics (DPD) that is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). This option enables graduates to continue pursuing the credentials of a registered dietitian (RD). Becoming an RD is currently a three-step process:

1. Successfully complete an ACEND-accredited DPD program (e.g. the NMSU Dietetics Option), earn a degree and a verification statement
  - a. The verification statement ensures eligibility to apply to the next step.
2. Successfully complete an ACEND-accredited Dietetic Internship (DI) program, earn another verification statement.
  - a. This 2nd verification statement ensures eligibility to begin the next step.
3. Pass the Commission on Dietetic Registration (CDR) registration exam.

## General Education Requirements

Areas I-III are incorporated into the Pre-Dietetics/Dietetics course list below. Students are able to select the five required courses from Areas IV-V and two required courses from the Viewing a Wider World (p. 46) section in the General Requirements (p. 46) section of the catalog.

Please refer to the HNDS Undergraduate Student Handbook for a list of recommended courses to choose from in order to fulfill these requirements.

### Departmental Requirements

FCSE 348	Teaching in Informal Family and Consumer Sciences Settings	3
FSTE 263G	Food Science I	4
FSTE 320	Food Microbiology	4
FSTE 425	Sensory Evaluation of Foods	3

or		
other upper division FSTE		
HNDS 201	Seminar I- The Field of Dietetics	1
HNDS 251	Human Nutrition	3
HNDS 350	Nutrition Throughout the Lifecycle	3
HNDS 360	Food for Health	4
HNDS 401	Field Experience- Clinical Dietetics	1-8
HNDS 403	Community Nutrition	3
HNDS 405	Seminar II- Entering the Field of Dietetics	1
HNDS 407	Field Experience Community Nutrition	1-8
HNDS 409	Dietetic Science Capstone	3
HNDS 420	Nutrition Counseling and Communication	3
HNDS 430	Food Service Organization and Management	3
HNDS 440	Nutrition Education and Research	3
HNDS 446	Diet Therapy I	3
HNDS 448	Advanced Nutrition	3
HNDS 449	Diet Therapy II	3
HNDS 455	Billing and Coding for Dietetics	3

### Nondepartmental Requirements

ENGL 111G	Rhetoric and Composition	4
Select one from the following:		
ENGL 203G	Business and Professional Communication	3
ENGL 218G	Technical and Scientific Communication	
ENGL 318G	Advanced Technical and Professional Communication	
Select one from the following:		
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
MATH 121G	College Algebra	3
or MATH 142G	Calculus for the Biological and Management Sciences	
BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
CHEM 111G	General Chemistry I	4
A ST 311	Statistical Applications	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
ACCT 221	Principles of Accounting I (Financial)	3
BCHE 341	Survey of Biochemistry	4
Select one from the following:		
BIOL 225	Human Anatomy and Physiology I	4

SP M 271 & 271 L	Anatomy & Physiology I and Anatomy and Physiology Laboratory	
Select one from the following:		4
BIOL 226	Human Anatomy and Physiology II	
SP M 371 & 371 L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
BIOL 227	Pathophysiology	3
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4
HRTM 263	Food Production and Service Fundamentals	3
Total Credits		108-122

### Viewing a Wider World

Refer to the "List of Recommended GE courses" for HNDS students in the HNDS Undergraduate Student Handbook for a list of field-related course options that can be selected from the GE Core Curriculum and Viewing a Wider World course requirements.

<http://aces.nmsu.edu/academics/FCS/documents/hnds-dietetics-option-road-map-2016-2017.pdf>

<http://aces.nmsu.edu/academics/FCS/documents/hnds-nutrition-education-option-road-map-2016-2017.pdf>

## Child Advocacy Studies (CAST) - Undergraduate Minor

A minor in Child Advocacy Studies (CAST) is available. The minor requires a minimum of 18 hours of which 9 hours are specifically concentrated in the area of child advocacy at the 300 or higher level. Specific coursework requirements apply and consultation with an advisor for course requirements and scheduling is urged.

## Clothing, Textiles and Fashion Merchandising - Undergraduate Minor

A minor in Clothing, Textiles and Fashion Merchandising is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the 300 or higher level. Specific coursework requirements may apply. See an advisor for course requirements and scheduling.

## Culinary Science - Undergraduate Minor

A minor in Culinary Science is available. The minor requires a minimum of 18 credits of which a minimum of 9 hours must be at the 300 or higher level. Specific coursework requirements apply and depend on the student's specific major. See an advisor for course requirements and scheduling.

## Family and Child Science - Undergraduate Minor

A minor in Family and Child Science is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the

300 or higher level. Specific coursework requirements may apply. See an advisor for course requirements and scheduling.

## Food Science - Undergraduate Minor

A minor in Food Science is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the 300 or higher level. Specific coursework requirements may apply. See an advisor for course requirements and scheduling.

## Nutrition - Undergraduate Minor

A minor in Nutrition is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the 300 or higher level. Specific coursework requirements may apply. See an advisor for course requirements and scheduling.

## Family and Consumer Sciences - Master of Science

The Master of Science degree in Family and Consumer Sciences can be obtained with an emphasis in one of the following areas:

- hotel, restaurant and tourism management;
- clothing, textiles and fashion merchandising;
- family and child science (marriage and family therapy emphasis or teaching and research emphasis);
- human nutrition and dietetic sciences (dietetic internship emphasis or human nutrition emphasis);
- food science and technology;
- family and consumer sciences education;
- or general family and consumer sciences.

A minor may be taken in a variety of supporting fields that fit the particular interests of the candidate. A minimum of 30 credits (including 4-6 credits of thesis) is required under the thesis plan and is the recommended program for most students. A non-thesis plan is available that requires a minimum of 32 credits of course work with a written comprehensive examination. Both plans require a final oral examination.

Students will take 3 credits of statistics and 3 credits of research methodology at the graduate level. Students may be required to take a graduate-level technical writing course based on demonstrated writing ability in initial graduate courses. Students who do not have degrees related to their intended areas of specialization may be required to do some leveling work. Prior to the completion of 12 credits, a program advisory committee will be established to determine, with the student, the courses that will be taken for the degree work.

## Fish, Wildlife and Conservation Ecology

### Undergraduate Program Information

Through lecture courses, labs, hands-on field experience and internships, the Department of Fish, Wildlife and Conservation Ecology will prepare you for a career in a variety of natural resource fields related to the conservation and management of wild animal populations and the natural systems they perpetuate. Award-winning professors will guide students in the study of how to manage fish and wildlife populations, their habitats, how their populations grow and contract, how different

species influence the biotic community in which they live and how natural systems are affected by human activities.

### **Bachelor of Science in Fish, Wildlife and Conservation Ecology.**

With the continuous growth of human populations and the ever dwindling of natural resources, natural resource professionals are needed now more than ever. Learn how to sustainably manage fish and wildlife populations and the habitats they utilize to ensure their long-term successful conservation. We offer two options within this degree. The Wildlife Ecology and Management option focuses on the ecology, conservation and management of wildlife (including mammals, birds, amphibians, and reptiles) in their natural habitats. The Aquatic Ecology and Management option focuses on the ecology, conservation and management of aquatic resources and the animals and plants found in them.

The department offers a minor in Wildlife Science for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

### **Bachelor of Science in Conservation Ecology**

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from Fish, Wildlife and Conservation Ecology, Biology, and Geography.

This educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. If biochemistry is taken as an elective, this curriculum provides the necessary educational background for pre-vet requirements, thus preparing students for veterinary school and future jobs such as wildlife or zoo veterinarian, or conservation medicine practitioner. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The department offers a minor in Conservation Ecology for students majoring in other disciplines. The minor includes 20 credits.

To graduate from the Department of Fish, Wildlife and Conservation Ecology, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU.

## **Graduate Program Information**

### **Master of Science in Fish, Wildlife and Conservation Ecology.**

The Department of Fish, Wildlife and Conservation Ecology (FWCE) offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. Faculty members in the department also may advise Ph.D. candidates through the graduate program in the Department of Biology, Department of Animal and Range Sciences, Department of Plant and Environmental Sciences, as well as other Ph.D. granting departments. For additional information please see the graduate catalog entries for the respective departments.

Minimum qualifications for admission to the graduate program include the following:

- 3.0 grade-point average in the last two years of undergraduate work
- Students who are most competitive for admission are those with a combined average GRE score greater than 70th percentile on the verbal and quantitative parts of the GRE.
- Course work in zoology, botany and animal ecology and a basic appreciation of sustainable use of natural resources, with supporting courses in mathematics, chemistry, physics and written and oral communication.

Applicants should submit a written composition of approximately 350 words that indicates the applicant's reasons for pursuing advanced study, explains personal and educational goals, and any additional experiences (e.g., military or career) or skills that might provide a foundation for graduate study. Applicants should submit three letters of recommendation (it is preferred that at least two letters come from university instructors) along with official GRE scores (use NMSU code 4531). Applicants should also contact a faculty member in the department that they would like to work with as an advisor, and that faculty member needs to agree to serve as the student's advisor. Application forms, application fee and transcripts, GRE scores, letters of recommendation and letter of application should be submitted online to the Graduate School. Successful applicants will be selected from those who meet the criteria of grade-point average, GRE scores, and educational background described above and who appear to have professional promise as indicated by personal history and written references.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a thesis for most students. Of these credits, at least 15 must be in courses numbered 500 or above, and at least 15 must be for courses with the FWCE prefix. Those programs involving a thesis or research project include 4 to 6 credits of research (FWCE 598 Special Research Programs or FWCE 599 Master's Thesis). Students electing a minor in FWCE are required to take at least 9 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

All students in the program must complete the following requirements:

- A ST 505 Statistical Inference I or equivalent
- One semester of Graduate Seminar (FWCE 515 Graduate Seminar - may be repeated for credit)
- A minimum of 3 additional credits from the Quantitative Methods category in addition to A ST 505 Statistical Inference I (eligible courses listed below)

- One course each from the Ecological Concepts, Organismal Biology and Ecological Techniques categories (eligible courses listed below)
- 4 to 9 credits from the Independent Study category (eligible courses listed below)

In addition, a student may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas. Courses other than those listed may be acceptable, given permission by the student's supervisory committee

## Degrees for the Department

Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 141)

Fisheries and Wildlife Science - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 142)

Fish, Wildlife and Conservation Ecology - Master of Science (p. 146)

## Minors for the Department

Conservation Ecology - Undergraduate Minor (p. 145)

Wildlife Science - Undergraduate Minor (p. 146)

**Professor, Kathryn E. Stoner, Department Head**

**Professors** Boeing, Caldwell, Cowley, Desmond, Roemer; **Associate Professor** Cain; **Assistant Professor** Gebreselassie; **College Associate Professors** Boykin, Frey

*K.E. Stoner— Department Head, Ph.D. (University of Kansas)— ecology and conservation of neotropical mammals; W.J. Boeing, Ph.D. (Louisiana State University)— aquatic ecology; K.G. Boykin, Ph.D. (New Mexico State University)— spatial ecology and conservation; J. W. Cain, Ph.D. (University of Arizona)— large mammal ecology, conservation and management; C. A. Caldwell, Ph.D. (University of Tennessee)— fish biology; D. E. Cowley, Ph.D. (University of Wisconsin-Madison)— fish conservation genetics; M.J. Desmond, Ph.D. (University of Nebraska)— avian ecology and conservation; J.K. Frey, Ph.D. (University of New Mexico)— ecology and conservation of mammals; F.A. Gebreselassie, Ph.D. (University of Bern Switzerland)- Capture-recapture models, Integrated population models; G. W. Roemer, Ph.D. (UCLA)— behavioral, population and community ecology and conservation biology.*

## Fish, Wildlife and Conservation Ecology Courses

**FWCE 109. Contemporary Issues in Wildlife and Natural Resources Management**  
**3 Credits**

Ecological, socioeconomic, and political issues surrounding the management of our natural resources with an emphasis on fish and wildlife resources.

**FWCE 110G. Introduction to Natural Resources Management**  
**4 Credits (3+2P)**

This class covers historical and current issues affecting the management of renewable natural resources with an emphasis on water, soil, rangeland, forest, fish, and wildlife resources. An emphasis is placed on the scientific method and critical thinking. In the laboratory students collect and analyze field data on topics covered above and write up each unit as a laboratory report.

**FWCE 255. Principles of Fish and Wildlife Management**  
**3 Credits**

Basic principles of fish and wildlife management including history, ecology, economics, and policy. Emphasis on wildlife and fisheries. Uses an ecosystem approach integrating living and nonliving resources.

**Prerequisite(s):** FWCE 110.

**FWCE 301. Wildlife Ecology**

**3 Credits**

General ecological theory with emphasis on concepts including biogeography, species interactions, population dynamics and disease ecology as they relate to the management and conservation of vertebrates.

**Prerequisite(s):** BIOL 111G or BIOL 190.

**FWCE 330. Natural History of the Vertebrates**

**4 Credits (3+3P)**

Evolution, ecology, and diversity of vertebrates. Topics include comparative anatomy and physiology, biogeography, community ecology, behavior, and conservation. Laboratory emphasizes identification of local taxa. Field trips may be required.

**Prerequisite(s)/Corequisite(s):** BIOL 322 Zoology. Prerequisite(s): BIOL 111G and BIOL 111L.

**FWCE 355. Wildlife Techniques and Analysis**

**4 Credits (3+2P)**

FWCE 355 will provide a broad overview of basic skills and techniques that are commonly used by biologists in performing management, research, and reporting functions in natural resource fields with an emphasis on wildlife techniques, data processing and analysis.

**Prerequisite(s):** FWCE 301, A ST 311.

**FWCE 357. Fisheries Management and Analysis**

**4 Credits (3+2P)**

Lectures and laboratory exercises provide a broad overview of basic skills and techniques used for assessing and managing fish populations.

**Prerequisite(s):** FWCE 301 and A ST 311.

**FWCE 391. Internship**

**1-3 Credits (1-3)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**Prerequisite(s):** Consent of instructor.

**FWCE 393. Professional Experience and Communication**

**3 Credits**

Professional work experience under the supervision of employer and/or a faculty member. Written report and presentation is required.

**Prerequisite(s)/Corequisite(s):** FWCE 255.

**FWCE 402. Seminar in Natural Resource Management**

**1 Credit**

Review and discussion of current topics in natural resource management.

**Prerequisite(s):** Senior standing or above.

**FWCE 409. Introduction to Population Ecology**

**3 Credits**

Quantitative analysis of vital statistics and mechanisms affecting dynamics of wild populations. Patterns of growth, age structure, survival, and natality. Population theories and life tables.

**Prerequisite(s):** MATH 142G and FWCE 255.

**FWCE 430. Avian Field Ecology****4 Credits (3+3P)**

Principles of avian ecology and management with an emphasis on taxonomy, physiology, behavior and field studies. Includes weekly field trips focusing on identification and behavior of Southwest birds. Pre/  
**Prerequisite(s)/Corequisite(s):** WLSC 330.

**FWCE 431. Mammalogy****4 Credits (3+2P)**

Classification, identification, anatomy, physiology, life history, and ecology of mammals. Field trips required.

**Prerequisite(s):** FWCE 255 and FWCE 330.

**FWCE 432. Environmental Biology of Fishes****4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 532.

**Prerequisite(s):** CHEM 111G and senior standing.

**FWCE 433. Fisheries Management****3 Credits**

This course is designed to introduce students to the basic principles of fisheries management. Students will learn the techniques and tools used to collect, analyze, and interpret fisheries data needed to undertake fisheries management decisions. Taught with FWCE 533. Consent of Instructor required.

**Prerequisite(s):** FWCE 482 and A ST 311.

**FWCE 434. Aquatic Contaminants and Toxicology****4 Credits (3+3P)**

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Taught with FWCE 534. Crosslisted with: E S 434.

**Prerequisite(s):** CHEM 111G and senior standing.

**FWCE 436. Large Mammal Ecology, Conservation and Management****3 Credits**

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 530. Consent of Instructor required.

**FWCE 437. Wildlife Damage Management****3 Credits**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 537.

**Prerequisite(s):** BIOL 111G, FWCE 255, FWCE 301, FWCE 409.

**FWCE 439. Game Bird Ecology and Management****3 Credits**

In this class we will look at the overall history of game bird management and conservation, how management and conservation of game birds was and still is the foundation for wildlife conservation in North America, define the challenges both past and present to managing and conserving game bird populations, and explore the conceptual and quantitative models used to manage migratory and non-migratory game birds. Taught with FWCE 539. Consent of Instructor required. Restricted to: WLSC, FISH majors.

**Prerequisite(s):** FWCE 301, FWCE 409, A ST 311 or equivalent.

**FWCE 440. Wildlife Habitat Relationships****3 Credits**

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses. Taught with FWCE 540. Consent of Instructor required.

**FWCE 447. Wildlife Law and Policy****3 Credits**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 547.

**Prerequisite(s):** Junior or Senior level standing.

**FWCE 448. Problems****1-3 Credits (1-3)**

Individual investigations in fishery or wildlife science. Maximum 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** 18 credits in WLSC.

**FWCE 450. Special Topics****1-4 Credits (1-4)**

Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester. May be repeated up to 9 credits. Consent of Instructor required.

**FWCE 457. Ecological Biometry****3 Credits**

Use of ecological data to test scientific hypotheses, stochastic and statistical models for environmental data, data visualization, likelihood-based and information-based model selection. Emphasis on open-source software tools.

**Prerequisite(s):** MATH 142G or 191G, E ST 311, FWCE 301.

**FWCE 459. Aquatic Ecology****4 Credits**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 559.

**Prerequisite(s):** FWCE 301 or BIOL 301, CHEM 112, MATH 142G.

**FWCE 464. Management of Aquatic and Terrestrial Ecosystems****4 Credits (3+2P)**

Principles and methods for managing aquatic and terrestrial ecosystems and their fish and wildlife resources. Emphasis on quantitative techniques, data collection and analysis for management of systems at a landscape spatial scale.

**Prerequisite(s):** (BIOL 301 or FWCE 301) FWCE 330, A ST 311 G.

**FWCE 467. Herpetology****4 Credits**

Systematics, taxonomy, ecology, behavior, and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 567.

**Prerequisite(s):** FWCE 330.

**FWCE 471. GIS for Natural Resource Scientists****4 Credits**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 571.

**FWCE 472. Wildlife Museum Internship****1-4 Credits (1-4)**

Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** BIOL 111G and BIOL 111GL.

**FWCE 473. Natural History Museum Functions Methods****3 Credits**

Fundamentals of the function and methods of natural history museums in research, education, service, and biodiversity conservation. Emphasis on experiential learning. Includes lectures, paper discussions, laboratory activities, specimen preparation, required full-day Friday field trips, and an individual term project.

**Prerequisite(s):** FWCE 330 or BIOL 322 or BIOL 312 or RGSC 316.

**FWCE 482. Ichthyology****4 Credits (3+2P)**

Classification, morphology, identification, life history, and ecology of fishes.

**Prerequisite(s):** FWCE 330 or consent of instructor.

**FWCE 509. Population Ecology (s)****3 Credits (2+2P)**

Quantitative analysis of vital statistics and mechanisms promoting stability in wild populations. Theory and application of life tables and population models.

**FWCE 515. Graduate Seminar****1 Credit**

Current topics.

**FWCE 530. Large Mammal Ecology, Conservation and Management****3 Credits**

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 436.

**FWCE 532. Environmental Biology of Fishes****4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 432; however, students are responsible for all requirements in FWCE 432, plus additional assignments.

**FWCE 533. Fisheries Management****3 Credits**

This course is designed to introduce students to the basic principles of fisheries management. Students will learn the techniques and tools used to collect, analyze, and interpret fisheries data needed to undertake fisheries management decisions. Taught with FWCE 433. Consent of Instructor required.

**Prerequisite(s):** FWCE 482, A ST 311.

**FWCE 534. Aquatic Contaminants and Toxicology****4 Credits (3+3P)**

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Students are responsible for all requirements for FWCE 434 plus additional work.

**FWCE 535. Special Topics****1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**FWCE 536. Advanced Avian Ecology****3 Credits**

Focuses on current topics and literature in avian ecology including systematics, mating systems, behavior, physiology, movement patterns and conservation. Includes required overnight field trips.

**Prerequisite(s):** Graduate standing or consent of instructor.

**FWCE 537. Wildlife Damage Management****3 Credits**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 437. Students are responsible for all requirements for FWCE 437 plus additional work. Prerequisite(s): BIOL 111G, FWCE 255, FWCE 301 and FWCE 409

**FWCE 539. Game Bird Ecology and Management****3 Credits**

In this class we will look at the overall history of game bird management and conservation, how management and conservation of game birds was and still is the foundation for wildlife conservation in North America, define the challenges both past and present to managing and conserving game bird populations, and explore the conceptual and quantitative models used to manage migratory and non-migratory game birds. Taught with FWCE 439. Restricted to: WLSC, FISH majors.

**Prerequisite(s):** FWCE 301, FWCE 409, A ST 311 or equivalent.

**FWCE 540. Wildlife Habitat Relationships****3 Credits**

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses. Taught with FWCE 440.

**FWCE 547. Wildlife Law and Policy****3 Credits**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 447.

**FWCE 548. Graduate Problems****1-3 Credits (1-3)**

Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree. May be repeated up to 6 credits.

**FWCE 558. Nonthesis Project****1-6 Credits (1-6)**

Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students. May be repeated up to 6 credits.

**FWCE 559. Aquatic Ecology****4 Credits**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 459.

**Prerequisite(s):** FWCE 301 or BIOL 301, CHEM 112, MATH 142G.

**FWCE 567. Herpetology****4 Credits**

Systematics, taxonomy, ecology, behavior and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 467.

**FWCE 571. GIS for Natural Resource Scientists****4 Credits**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 471.

**FWCE 582. Ichthyology****4 Credits**

Classification, morphology, identification, life history, and ecology of fishes. Taught with FWCE 482.

**FWCE 598. Special Research Programs****1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program. May be repeated up to 6 credits.

**FWCE 599. Master's Thesis****1-9 Credits (1-9)**

Thesis. May be repeated up to 30 credits. Thesis/Dissertation Grading.

**Office Location:** Knox Hall 132

**Phone:** (575) 646-1544

**Website:** <http://aces.nmsu.edu/academics/fws/>

## Conservation Ecology - Bachelor of Science in Conservation Ecology

**Co-directors of the Program:**

**Regents Professor, Michelle K. Nishiguchi**, Department Head, Biology

**Professor, Kathryn E. Stoner**, Department Head, Fish, Wildlife and Conservation Ecology

**Professors** Boecklen, Boeing, Caldwell, Cowley, Desmond, Hanley, Houde, Milligan, Nishiguchi, Roemer, G. Smith, Wright; **Associate Professors** Bailey, Cain, Mabry; **Assistant Professor** Ferrenberg, Gebreselassie; **College Associate Professors** Boykin, Frey

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of natural resources. An overriding principle

of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from Fish, Wildlife and Conservation Ecology, Biology, and Geography.

This educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. If biochemistry is taken as an elective, this curriculum provides the necessary educational background for many pre-vet requirements, thus preparing students for veterinary school and future jobs such as wildlife or zoo veterinarian, or conservation medicine practitioner. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth. To graduate, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU. The department offers a minor in Conservation Ecology for students majoring in other disciplines. The minor includes 20 credits.

### New Mexico and University Requirements

<i>Area I: Communications</i>		
ENGL 111G	Rhetoric and Composition	4
ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	
Select one from the following:		3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
<i>Area II: Mathematics</i>		
MATH 142G	Calculus for the Biological and Management Sciences	3
<i>Area III: Science, with Laboratory</i>		
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
Select a total of 15 combined credits from Areas IV and V, with at least 9 credits in one of the two areas: <sup>1</sup>		15
<i>Area IV: Social Behavioral Sciences: Select 6-9 credits including one from the following:</i>		
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	

ECON 252G	Principles of Microeconomics	
<i>Area V: Humanities and Fine Arts: Select 6-9 credits</i> <sup>1</sup>		
<b>Viewing a Wider World</b>		3
ECON 337V	Natural Resource Economics	
The second VWW course will be achieved with the 9 credit 300-level rule <sup>2</sup>		
<b>Core Curriculum</b>		
A ST 311	Statistical Applications	3
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4
<b>Physiology</b>		
Select 3-4 credits from the following:		3-4
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 314	Plant Physiology	
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BIOL 381	Animal Physiology	
FWCE 432	Environmental Biology of Fishes	
<b>Major Requirements</b>		
AGRO 305	Principles of Genetics	3
or BIOL 305	Principles of Genetics	
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
BIOL 322	Zoology	3
BIOL 462	Conservation Biology	3
BIOL 467	Evolution	3
BIOL 488	Principles of Conservation Genetics	3
FWCE 110G	Introduction to Natural Resources Management	4
FWCE 255	Principles of Fish and Wildlife Management	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	4
One from the following sequences:		8
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
or		
PHYS 221G & 221GL	General Physics for Life Sciences I and Laboratory to General Physics for Life Science I	

PHYS 222G & 222GL	General Physics for Life Sciences II and Laboratory to General Physics for Life Sciences II	
<b>Requirements in Diversity of Life</b>		
Select 6-8 credits from BIOL or FWCE:		6-8
BIOL 408	Ecology of Plants	
BIOL 465	Invertebrate Zoology	
BIOL 480	Animal Behavior	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
<b>Other Related Courses</b>		
BCHE 341	Survey of Biochemistry	
BIOL 436	Disease Vector Biology	
BIOL 442	Genomics Technology	
BIOL 446	Bioinformatics and NCBI Database	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 489	Genetic Aspects of Population Biology	
FWCE 457	Ecological Biometry	
FWCE 471	GIS for Natural Resource Scientists	
GEOG 381	Cartography and Geographic Information Systems	
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)	
GEOL 111G	Introductory Geology	
GEOL 424	Soil Chemistry	
GOVT 378	U.S.-Mexico Border Politics	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
RGSC 452	Vegetation Measurements for Rangeland Assessment	
Elective Course		3
Total Credits		120-123

<sup>1</sup> Areas IV and V are linked. You have to take a total of 15 credits between these two areas, for example, either 9 credits in Area IV and 6 credits in Area V or vice versa. See Required Courses (p. 46) section.

<sup>2</sup> 9 credits can be taken within a single department (e.g. Biology) that is outside the College of ACES, this will count for the second VWW class requirement.

## Fisheries and Wildlife Science - Bachelor of Science in Fish, Wildlife and Conservation Ecology

The Department of Fish, Wildlife and Conservation Ecology prepares you for careers in a variety of natural resource fields related to the management of wild animal populations and the natural systems they share. Two options are found within this major.

- The Wildlife Ecology and Management Concentration is for students who plan to focus on terrestrial organisms, and

- The Aquatic Ecology and Management Concentration is for students who want to focus on fish and aquatic systems.

To graduate, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU. In addition, each required course must be passed with a grade of C- or better. The department offers a minor in Fish, Wildlife and Conservation Ecology for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

**New Mexico and University Requirements**

<b>Area I: Communications</b>		
ENGL 111G	Rhetoric and Composition	4
ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	
Select one from the following:		3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
<b>Area II: Mathematics</b>		
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 191G	Calculus and Analytic Geometry I	
<b>Area III: Science, with Laboratory</b>		
BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
Select one from the following:		4
PHYS 110G	The Great Ideas of Physics	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
<b>Area IV &amp; V: Social/Behavioral Sciences and Humanities and Fine Arts</b>		
Select a total of 15 combined credits from Areas IV and V, with at least 9 credits in one of the two areas: <sup>1</sup>		15
Area IV: Social/Behavioral Sciences: Select 6-9 credits including the following: <sup>1</sup>		
ECON 251G	Principles of Macroeconomics	
or ECON 252G	Principles of Microeconomics	
Area V: Humanities and Fine Arts: Select 6-9 credits <sup>1</sup>		
<b>Viewing a Wider World</b>		
Select 3 credits from Viewing a Wider World courses <sup>2</sup>		3
<b>Extra-Departmental Core Courses<sup>3</sup></b>		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 322	Zoology	3
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
Select one from the following:		4
GEOL 111G	Introductory Geology	
SOIL 252 & 252 L	Soils and Soils Laboratory	

**Departmental Core Courses**

FWCE 110G	Introduction to Natural Resources Management	4
FWCE 255	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 391	Internship	3
FWCE 393	Professional Experience and Communication	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 457	Ecological Biometry	3
or BIOL 488	Principles of Conservation Genetics	
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	4

**Departmental Botany Requirements**

BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
Select one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	

**Departmental Physiology Requirements**

Select 3-4 credits from the following:		3-4
FWCE 432	Environmental Biology of Fishes	
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 381	Animal Physiology	

**Program Concentration**

Aquatic Ecology and Management or Wildlife Ecology and Management Concentration <sup>5</sup>	17-20
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**Additional Electives**

Select additional credits so the total adds up to at least 128 credits including 55 credits 300- and 400-level classes.

Total Credits	127-131
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<sup>1</sup> Areas IV and V are linked. You have to take a total of 15 credits between these two areas, for example, either 9 credits in Area IV and 6 credits in Area V or vice versa. See Required Courses (p. 46) section.

<sup>2</sup> 3 credits can be taken inside the College of ACES, but 3 credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of ACES. See Viewing a Wider World (p. 46) section.

<sup>3</sup> Students intending to pursue graduate studies should also take CHEM 211 Organic Chemistry.

<sup>4</sup> Off campus students can take FWCE 109 Contemporary Issues in Wildlife and Natural Resources Management Distance Education.

<sup>5</sup> Students Must Declare One of the Two Options. A maximum of 3 credits of FWCE 448 Problems can count towards the Option. More credits can be taken towards the degree.

## Concentration: Aquatic Ecology and Management

### Techniques

FWCE 357	Fisheries Management and Analysis	4
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### Management

Select 3-4 credits from the following: 3-4

FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
RGSC 318	Watershed Management	

### Organismal Biology

Select 3-4 credits from the following: <sup>6</sup> 3-4

BIOL 465	Invertebrate Zoology	4
EPWS 462	Parasitology	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	

### Wildlife Ecology and Management Electives

Select 3-4 credits from the following: 3-4

ACES 111	Freshman Orientation	
FWCE 448	Problems	
FWCE 450	Special Topics	
FWCE 471	GIS for Natural Resource Scientists	
FWCE 472	Wildlife Museum Internship	

Total Credits 17-20

<sup>6</sup> At least one course chosen must be a vertebrate taxonomy course with FWCE prefix, i.e., one of FWCE 467 Herpetology or FWCE 482 Ichthyology.

## Concentration: Wildlife Ecology and Management

### Techniques

FWCE 355	Wildlife Techniques and Analysis	4
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### Management

Select one from the following: 3

FWCE 436	Large Mammal Ecology, Conservation and Management	
FWCE 437	Wildlife Damage Management	
FWCE 440	Wildlife Habitat Relationships	
RGSC 325	Rangeland Restoration Ecology	

### Organismal Biology

Select 3-4 credits from the following: <sup>7</sup> 3-4

BIOL 484	Animal Communication	3
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	

### Aquatic Ecology and Management Elective

Select 3-4 credits of electives	3-4
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Total Credits	16-18
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<sup>7</sup> At least one course chosen must be a vertebrate taxonomy course with FWCE prefix, i.e., one of FWCE 467 Herpetology or FWCE 482 Ichthyology.

## Additional Electives

Take additional credits so the total adds up to at least 128 credits including 55 credits 300- and 400-level classes.

Students are encouraged to pursue a minor course of study with a department of their choosing.

Compatible minors include, but are not limited to:

- animal science,
- biology,
- chemistry,
- environmental science,
- forensic sciences,
- geography,
- journalism,
- management,
- and range science.

### Notes:

1. No more than 6 credits of Physical Education classes will count towards your degree.
2. Maximum of two grades of 'D' in FWCE classes will count towards a student's degree.

Course	Title	Credits
<b>Freshman</b>		
<b>Fall</b>		
ENGL 111G	Rhetoric and Composition	4
MATH 142G	Calculus for the Biological and Management Sciences	3
Area V: Humanities and Fine Arts Course <sup>1</sup>		3
PHIL 101G	The Art of Wondering(Recommended)	
PHIL 211G	Informal Logic(Recommended)	
FWCE 110G	Introduction to Natural Resources Management	4
Electives to bring fall semester to 15 credits total:		1
Credits		15
<b>Spring</b>		
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	4
Area IV: Social and Behavioral Science Course <sup>1</sup>		3
FWCE 255	Principles of Fish and Wildlife Management	3
COMM 265G or AXED 201G	Principles of Human Communication or Effective Leadership and Communication in Agricultural Organizations	3
Area V: Humanities and Fine Arts Course <sup>1</sup>		3

PHIL 101G	The Art of Wondering(Recommended)	
PHIL 211G	Informal Logic(Recommended)	
Credits		16

**Sophomore****Fall**

CHEM 111G	General Chemistry I	4
ECON 251G	Principles of Macroeconomics	3
PHYS 110G	The Great Ideas of Physics	4
FWCE 301	Wildlife Ecology	3
Electives to bring fall semester to 15 credits total:		1
Credits		15

**Spring**

CHEM 112G	General Chemistry II	4
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	4
SOIL 252	Soils	3
Either an Area IV: Humanities and Fine Arts/ Area V: Social and Behavioral Sciences Course <sup>1</sup>		3
Credits		14

**Junior****Fall**

AGRO 305	Principles of Genetics	3
BIOL 312	Plant Taxonomy	3
A ST 311	Statistical Applications	3
BIOL 322	Zoology	3
ENGL 218G	Technical and Scientific Communication	3
Credits		15

**Spring**

FWCE 330	Natural History of the Vertebrates	4
FWCE 355	Wildlife Techniques and Analysis	4
One Organismal/Aquatic/or Management course from the following:		3-4
FWCE 431	Mammalogy(Organismal)	
FWCE 482	Ichthyology(Organismal)	
FWCE 432	Environmental Biology of Fishes(Aquatic)	
FWCE 434	Aquatic Contaminants and Toxicology(Aquatic)	
FWCE 471	GIS for Natural Resource Scientists(Management)	
FWCE 437	Wildlife Damage Management (Management)	
BIOL 313	Structure and Function of Plants	3
FWCE 447	Wildlife Law and Policy	3
Credits		17-18

**Senior****Fall**

FWCE 457	Ecological Biometry	3
FWCE 393	Professional Experience and Communication	3
One Viewing a Wider World course <sup>2</sup>		3
RGSC Grass Taxonomy and Identification <sup>3</sup>		6
BIOL 314	Plant Physiology	

and

RGSC 357 or RGSC 325 or RGSC 440	Grass Taxonomy and Identification or Rangeland Restoration Ecology or Rangeland Resource Ecology	
Credits		15

**Spring**

FWCE 432	Environmental Biology of Fishes	4
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	4
FWCE 409	Introduction to Population Ecology	3
FWCE 402	Seminar in Natural Resource Management	1
One Organismal/Aquatic/or Management course from the following:		3-4
FWCE 431	Mammalogy(Organismal)	
FWCE 482	Ichthyology(Organismal)	
FWCE 434	Aquatic Contaminants and Toxicology(Aquatic)	
FWCE 471	GIS for Natural Resource Scientists(Management)	
FWCE 437	Wildlife Damage Management(Management)	
Credits		15-16
Total Credits		122-124

<sup>1</sup> For a list of courses see the General Education (p. 46) Section of this catalog.

<sup>2</sup> For a list of courses see the Viewing a Wider World (p. 46) Section of this catalog.

<sup>3</sup> The Degree botany requirement (9 credits total of botany courses)

Students must take one Physiology course, one Techniques course, two Organismal courses (at least onw with FWCE prefix), one Management course and one Aquatic course.

## Conservation Ecology - Undergraduate Minor

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. The minor must include a minimum of 18 credits.

### Requirements

**Core Curriculum**

BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	4
BIOL 301 or FWCE 301	Principles of Ecology Wildlife Ecology	3
BIOL 462	Conservation Biology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1

**Electives**

Select 3 credits from the following:		3
FWCE 447	Wildlife Law and Policy	

or ECON 337V Natural Resource Economics  
 or ECON 384V Water Resource Economics  
 or HORT 302V Forestry and Society

BIOL 322	Zoology	
BIOL 408	Ecology of Plants	
BIOL 465	Invertebrate Zoology	
BIOL 467	Evolution	
BIOL 488	Principles of Conservation Genetics	
FWCE 409	Introduction to Population Ecology	
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	
Total Credits		18

## Wildlife Science - Undergraduate Minor

The Department offers a minor in Wildlife Science for students majoring in other disciplines. The minor consists of a minimum of 18 credit hours.

### Required Courses

FWCE 109 & FWCE 402	Contemporary Issues in Wildlife and Natural Resources Management and Seminar in Natural Resource Management (Seminar in Natural Resources Management)	4
or		
FWCE 110G	Introduction to Natural Resources Management	
FWCE 255	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	4
Total Credits		18

## Fish, Wildlife and Conservation Ecology - Master of Science in Fish, Wildlife and Conservation Ecology

The Department of Fish, Wildlife and Conservation Ecology (FWCE) offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. Faculty members in the department also may advise Ph.D. candidates through the graduate program in the Department of Biology, Department of Animal and Range Sciences, Department of Plant and Environmental Sciences, as well as other Ph.D. granting departments. For additional information please see the graduate catalog entries for the respective departments.

Minimum qualifications for admission to the graduate program include the following:

- 3.0 grade-point average in the last two years of undergraduate work
- Students who are most competitive for admission are those with a combined average GRE score greater than 70th percentile on the verbal and quantitative parts of the GRE.

- Course work in zoology, botany and animal ecology and a basic appreciation of sustainable use of natural resources, with supporting courses in mathematics, chemistry, physics and written and oral communication.

Applicants should submit a written composition of approximately 350 words that indicates the applicant's reasons for pursuing advanced study, explains personal and educational goals, and any additional experiences (e.g., military or career) or skills that might provide a foundation for graduate study. Applicants should submit three letters of recommendation (it is preferred that at least two letters come from university instructors) along with official GRE scores (the department code is 0115). Applicants should also contact a faculty member in the department that they would like to work with as an advisor, and that faculty member needs to agree to serve as the student's advisor. Application forms, application fee and transcripts, GRE scores, letters of recommendation and letter of application should be submitted online to the Graduate School. Successful applicants will be selected from those who meet the criteria of grade-point average, GRE scores, and educational background described above and who appear to have professional promise as indicated by personal history and written references.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a thesis for most students. Of these credits, at least 15 must be in courses numbered 500 or above, and at least 15 must be for courses with the FWCE prefix. Those programs involving a thesis or research project include 4 to 6 credits of research (FWCE 598 Special Research Programs or FWCE 599 Master's Thesis). Students electing a minor in FWCE are required to take at least 9 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

All students in the program must complete the following requirements:

- A ST 505 Statistical Inference I or equivalent
- One semester of Graduate Seminar (FWCE 515 Graduate Seminar - may be repeated for credit)
- A minimum of 3 additional credits from the Quantitative Methods category in addition to A ST 505 Statistical Inference I (eligible courses listed below)
- One course each from the Ecological Concepts, Organismal Biology and Ecological Techniques categories (eligible courses listed below)
- 4 to 9 credits from the Independent Study category (eligible courses listed below)

In addition, a student may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas. Courses other than those listed may be acceptable, given permission by the student's supervisory committee.

### Degree Requirements

A ST 505	Statistical Inference I (or equivalent)	4
FWCE 515	Graduate Seminar (may be repeated for credit)	1

### Quantitative Methods: Eligible Courses <sup>1</sup>

Select minimum of 3 credits from the following:		3
A ST 503	SAS Basics	
A ST 506	Statistical Inference II	
A ST 507	Advanced Regression	

A ST 515	Statistical Analysis with R	
A ST 523	Biological Sampling (s)	
A ST 550	Special Topics	
FWCE 509	Population Ecology (s)	
FWCE 457	Ecological Biometry	
GEOG 585	Advanced Spatial Analysis	
<b>Ecological Concepts: Eligible Courses</b>		
Select one from the following:		3-4
BIOL 467	Evolution	
BIOL 484	Animal Communication	
BIOL 489	Genetic Aspects of Population Biology	
BIOL 568	Communities and Ecosystems	
BIOL 587	Behavioral and Evolutionary Ecology	
FWCE 459	Aquatic Ecology	
FWCE 540	Wildlife Habitat Relationships	
GEOG 557	Fundamentals of Biogeography	
<b>Organismal Biology: Eligible courses</b>		
Select one from the following:		3-4
FWCE 532	Environmental Biology of Fishes	
FWCE 536	Advanced Avian Ecology	
FWCE 567	Herpetology	
FWCE 582	Ichthyology	
<b>Ecological Techniques: Eligible courses</b>		
Select one from the following:		3-4
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	
FWCE 530	Large Mammal Ecology, Conservation and Management	
FWCE 534	Aquatic Contaminants and Toxicology	
FWCE 537	Wildlife Damage Management	
FWCE 571	GIS for Natural Resource Scientists	
GEOG 521	GIS & T Applications and Modeling	
RGSC 452	Vegetation Measurements for Rangeland Assessment	
RGSC 518	Watershed Methods and Management	
<b>Independent Study: Eligible courses</b>		
Select one from the following:		4-9
FWCE 548	Graduate Problems <sup>2</sup>	
FWCE 598	Special Research Programs	
FWCE 599	Master's Thesis	
To meet the 30 credit hour requirements of the MS program, completion of 1 to 2 courses in addition to the requirements described above will be necessary. The additional course(s) must be approved by the graduate student's supervisory committee.		
Total Credits		21-29

<sup>1</sup> Other courses, particularly in Applied Statistics, may be eligible with consent of the advisory committee.

<sup>2</sup> Students may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas.

Graduate work in the department is intended to prepare students for careers in research, teaching, extension and management. Facilities

available to graduate students include two ranches of approximately 90,000 acres, a large suite of shared laboratories, and a large fish-culture facility. We actively cooperate with state and federal natural resource management agencies, and graduate students have access to national forests and extensive public lands, as well as the Jornada Basin Long-Term Ecological Research site and associated databases (see <http://jornada-www.nmsu.edu> for details). Additional research opportunities for graduate students are available in the New Mexico Cooperative Fish and Wildlife Research Unit, located in the department since 1988.

Additional information on the graduate program and faculty is available at <http://aces.nmsu.edu/academics/fws>.

## Plant and Environmental Sciences Undergraduate Program Information

The undergraduate program in Plant and Environmental Science prepares you for a variety of careers in agriculture and related fields. Accordingly, a flexible curriculum has been designed that will allow specific programs to be developed in consultation with your academic advisor. Programs may also be developed if you wish to prepare for advanced studies in graduate school. In addition to the courses listed for each major, 35 credits must be taken in the College of Agricultural, Consumer and Environmental Sciences, and the university general education requirements must be met.

The minors require a minimum of 18 credits of which at least 9 hours must be at the 300 or higher level. Specific coursework requirements apply. See advisor for course requirements and scheduling.

## Graduate Program Information

More than ever, we are linked in an interconnected world: both in agriculture and sustainability of environmental systems. The department has programs in

- plant sciences,
- environmental science,
- soil science,
- water management,
- natural resources management and
- turf management.

Students trained in these areas are in demand for U.S. and international positions. This demand is at all levels of training—BS, MS, and Ph.D. Therefore, the course work and original research in Plant and Environmental Sciences leading to the Master of Science and Doctor of Philosophy are designed for and have proven to be successful in preparing students for commercial companies, educational institutions, governmental agencies and private production enterprises.

The student may emphasize study in several discipline areas described in the following pages.

- The agronomy section emphasizes sustainable crop production, plant-pest/disease/weed interactions, soil-water-plant relations, crop physiology, and breeding and genetics of cotton, alfalfa, maize and peanuts.
- The genetics section places special emphasis on genetic basis of agronomic or horticultural traits, applied bioinformatics, gene regulation and genomics.

- The environmental and soil science sections emphasize environmental quality and ecosystem services, bioremediation, recycling of organic wastes and wastewater, water use efficiency, soil-plant relations, soil-geomorphology and desert ecology, and the fertility, chemistry, physics, and microbiology of soils, including forest soils.
- The horticulture section emphasizes the creative use of plants by humans, and studies on the technical advancements in the husbandry of most economic commodity groups of fruits, vegetables, or ornamentals as well as managed turf. Emphasis may be in breeding and genetics of chile or onions, plant growth and development, nutrition, dormancy and cold hardiness, plant stress (water and/or salinity) response, fruit and vegetable physiology, forestry, and turfgrass.

Most students will be expected to complete a thesis. The research detailed in a thesis should be of a scope and quality to merit publication in a refereed journal. Depending on prior training and experience, a non-thesis option is available subject to approval by a departmental committee. The non-thesis option requires completion of a research project and paper of limited scope. In both the thesis and non-thesis options, suitability of the research project and resulting thesis or paper will be judged by the student's graduate committee. A minor is recommended and may be taken in chemistry, biology, molecular biology, environmental management, applied statistics, toxicology or other areas.

Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University.

## Degrees for the Department

Agronomy - Bachelor of Science in Agriculture (p. 158)

Horticulture - Bachelor of Science in Agriculture (p. 161)

Soil Science - Bachelor of Science in Agriculture (p. 164)

Turfgrass Science and Management - Bachelor of Science in Agriculture (p. 166)

Environmental Science - Bachelor of Science in Environmental Science (p. 159)

Genetics and Biotechnology - Bachelor of Science in Genetics (p. 159)

Horticulture - Master of Science (p. 169)

Plant and Environmental Science - Master of Science (p. 169)

Plant and Environmental Science - Doctor of Philosophy (p. 169)

## Minors for the Department

Agronomy - Undergraduate Minor (p. 168)

Horticulture - Undergraduate Minor (p. 168)

Soil Science - Undergraduate Minor (p. 168)

Turfgrass Science and Management - Undergraduate Minor (p. 169)

### Professor, Rolston St. Hilaire, Department Head

**Professors** Bosland, Cramer, Guldán, Hanan, Leinauer, O'Connell, O'Neill, Picchioni, Pratt, Puppala, Ray, Sengupta-Gopalan, Shukla, Ulery, Zhang;  
**Associate Professors** Angadi, Flynn, Goss, Heerema, Idowu, Marsalis,

Yao; **Assistant Professors** Brungard, Burney, Djaman, Ghimire, Grover, Guzman, Holguin, Lombard, Pietrasiak Webb; **College Professors** Lauriault; **College Associate Professor** Stringam, Stringam, DuBois; **Research College Assistant Professors** Rodriguez-Uribe

*R. St. Hilaire, Department Head, Ph.D. (Iowa State University)–plant stress physiology and landscape horticulture; S. Angadi, Ph.D. (University of Manitoba, Canada)–crop physiology; D.L. Auld, Ph.D. (Montana State University)–plant genetics; W. Boeing, Ph.D. (Louisiana State University)–aquatic ecology; P.W. Bosland, Assistant Department Head, Ph.D. (University of Wisconsin, Madison)–chile breeding and genetics; C. Brungard, Ph.D. (Utah State University, Logan)–pedology; O. Burney, Ph.D. (Purdue University, West Lafayette)–silviculture and forest biology; K.C. Carroll, Ph.D. (University of Arizona)–hydrology and water resources; C. S. Cramer, Ph.D. (North Carolina State University)–onion breeding and horticulture; M. Darapunen, Ph.D. (Texan A&M, College Station)–Agronomy and semi-arid crop rotations; K. Djaman, Ph.D. (University of Nebraska-Lincoln)–soil & water resources and irrigation engineering; D. DuBois, Ph.D. (University of Nevada)–atmospheric science; M.C. Duniway, Ph.D. (New Mexico State University)–agronomy; R. Flynn, Ph.D. (Auburn University)–soil and water quality; R. Ghimire, Ph.D. (University of Wyoming, Laramie)–soil & crop management; R.M. Goss, Ph.D. (University of Nebraska, Lincoln)–turf science; K. Grover, Ph.D. (Pennsylvania State University)–agronomy; S.J. Guldán, Ph.D. (University of Minnesota)–sustainable agriculture; I. Guzman, Ph.D. (New Mexico State University)–horticulture; N. Hanan, Ph.D. (Queen Mary College, UK)–dryland ecology; S.F. Hanson, Ph.D. (University of Wisconsin-Madison)–genetics and microbiology; R.J. Heerema, Ph.D. (University of California, Davis)–pecans; F.O. Holguin, Ph.D. (New Mexico State University)–biochemical analysis; J. Idowu, Ph.D. (Cranfield University, United Kingdom)–agronomy and land management; B. Leinauer, Ph.D. (Hohenheim University, Germany)–turfgrass; K. Lombard, Ph.D. (New Mexico State University)–horticulture; M. Marsalis, Ph.D. (Texas Tech University)–forages; G. Niu, Ph.D. (Chiba University, Japan)–horticulture; M.A. O'Connell, Ph.D. (Cornell University)–plant biochemistry and molecular genetics; G.A. Picchioni, Ph.D. (Texas A&M University)–plant-mineral relations; N. Pietrasiak, Ph.D. (University of California, Riverside)–soil and water sciences; R. Pratt, Ph.D. (Purdue University)–plant breeding and genetics; N. Puppala, Ph.D. (New Mexico State University)–plant breeding and genetics; I.M. Ray, Ph.D. (University of Wisconsin-Madison)–alfalfa breeding and genetics; L. Rodriguez-Uribe, Ph.D. (New Mexico State University)–molecular genetics; D. Rucker, Ph.D. (University of Arizona)–hydrogeophysics; C. Sengupta-Gopalan, Ph.D. (Ohio State University)–biochemical genetics; M.K. Shukla, Ph.D. (University of Agricultural Sciences Vienna, Austria)–environmental soil physics; B. Stringam, Ph.D. (Utah State University)–biological and agricultural engineering; C. Steele, Ph.D. (King's College, University of London, United Kingdom)–range soils; A.L. Ulery, Ph.D. (University of California, Riverside)–environmental soil chemistry; S. J. Walker, Ph.D. (New Mexico State University)–horticulture; N. Webb Ph.D. (University of Queensland, Australia)–aeolian process, land degradation processes and rangeland management; S. Yao, Ph.D. (Cornell University)–pomology/horticulture; J. Zhang, Ph.D. (University of Arkansas, Fayetteville)–cotton breeding, genetics, and genomics*

## Agronomy Courses

### AGRO 100G. Introductory Plant Science

#### 4 Credits (3+2P)

Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as HORT 100G.

### AGRO 200. Special Topics

#### 1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

### AGRO 250. Plant Propagation

#### 3 Credits (2+2P)

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Crosslisted with HORT 250.

### AGRO 300. Special Topics

#### 1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

### AGRO 303V. Genetics and Society

#### 3 Credits

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: GENE 303V.

### AGRO 305. Principles of Genetics

#### 3 Credits

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: ANSC 305, BIOL 305, HORT 305 and GENE 305.

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

### AGRO 311. Introduction to Weed Science

#### 4 Credits

Principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Same EPWS 311.

**Prerequisite:** junior standing or consent of instructor and CHEM 111G and BIOL 211G.

### AGRO 315. Crop Physiology

#### 3 Credits

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 315

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

### AGRO 365. Principles of Crop Production

#### 4 Credits (3+3P)

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production.

Crosslisted with: HORT 365

**Prerequisite(s):** AGRO/HORT 100, CHEM 111G or equivalent and MATH 120 or equivalent.

### AGRO 377. Introduction to Turfgrass Management

#### 4 Credits (3+3P)

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with:

HORT 377

### AGRO 391. Internship

#### 1-6 Credits

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**Prerequisite(s):** Consent of instructor.

### AGRO 447. Seminar

#### 1 Credit

Organization, preparation, and presentation of current topics in agronomy, horticulture, and soil science. Same as HORT 447 and SOIL 447.

### AGRO 449. Special Problems

#### 1-3 Credits (1-3)

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

### AGRO 450. Special Topics

#### 1-4 Credits (1-4)

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

### AGRO 462. Plant Breeding

#### 3 Credits

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

### AGRO 471. Plant Mineral Nutrition

#### 3 Credits

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as HORT 471 and EPWS 471.

**Prerequisite:** EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

### AGRO 483. Sustainable Production of Agronomic Crops

#### 4 Credits (3+2P)

Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of cereal grain, fiber, forage and oilseed crops.

**Corequisite(s):** AGRO 365 or HORT 365.

**AGRO 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: HORT 486, E S 485, SOIL 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**AGRO 492. Diagnosing Plant Disorders****3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and HORT 492.

**Prerequisites:** EPWS 303 and EPWS 310.

**AGRO 500. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**AGRO 505. Research Orientation****4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505 and SOIL 505

**AGRO 506. Plant Genetics****3 Credits**

Advanced treatment of the principles of classical genetics and heredity with emphasis on the nature and action of the gene including molecular analysis. May be repeated up to 3 credits. Crosslisted with: HORT 506. CHEM 345 recommended.

**Prerequisite(s):** AGRO/GENE/HORT/BIOL/ANSC 305 or consent of instructor.

**AGRO 511. Introduction to Weed Science (f)****4 Credits**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Same as EPWS 511.

**Prerequisites:** CHEM 111G or BIOL 211G, or consent of instructor.

**AGRO 514. Soil-Plant Relationships****3 Credits**

Physical, chemical, and biological soil environment as it affects plant and crop growth. Same as HORT 514 and SOIL 514.

**Prerequisites:** BIOL 314, SOIL 252.

**AGRO 515. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 515

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**AGRO 516. Molecular Analysis of Complex Traits****3 Credits**

Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Same as HORT 516.

**Prerequisite:** AGRO 305 or consent of instructor.

**AGRO 525. Scientific Writing- How to be a Productive and Effective Writer**  
**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: HORT 525, EPWS 525, SOIL 525, AGRO 625, HORT 625 and SOIL 625.

**AGRO 533. Environmental Physiology of Plants****3 Credits**

Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Same as BIOL/HORT 533.

**Prerequisite:** BIOL 314 or consent of instructor.

**AGRO 590. Graduate Seminar****1 Credit**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as HORT/SOIL 590. Crosslisted with: HORT 590 and SOIL 590.

**AGRO 595. Internship****1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

**AGRO 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: E S 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

**Prerequisite(s):** Master level graduate students.

**AGRO 597. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Restricted to: Main campus only. Restricted to Agronomy and Horticulture Graduate Students. Crosslisted with: HORT 597 and SOIL 597

**AGRO 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.

**AGRO 599. Master's Thesis****15 Credits**

Thesis.

**AGRO 600. Doctoral Research****1-15 Credits**

Research.

**AGRO 609. Breeding for Plant Disease Resistance****3 Credits**

A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. Same as HORT 609.

**AGRO 610. Advanced Crop Breeding****4 Credits (3+3P)**

Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. Same as HORT 610.

**Prerequisite:** AGRO 462 or consent of instructor.

**AGRO 620. Instrumentation in Agronomy****3 Credits**

Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as HORT/SOIL 620.

**AGRO 625. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students in the 600-level course will be required to perform additional research than those students in the 500-level cross-listing. Crosslisted with: AGRO 525, HORT 525, EPWS 525 and SOIL 525.

**AGRO 670. Biometrical Genetics and Plant Breeding****3 Credits**

A statistical approach to gene action and population parameters as applied to plant improvement. Same as HORT 670.

**Prerequisite:** AGRO 462 or consent of instructor.

**AGRO 694. Doctoral Seminar****1 Credit**

Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. Same as SOIL 694.

**Prerequisite:** doctoral level graduate students.

**AGRO 696. Doctoral Proposal****1 Credit**

Current research proposal written by doctoral level graduate students. Not more than 1 credits toward the degree. May be repeated up to 1 credits. Crosslisted with: E S 696, AGRO 696, HORT 696 and SOIL 696.

**Prerequisite(s):** Doctoral level graduate students.

**AGRO 697. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: HORT 697 and SOIL 697

**AGRO 698. Topics in Agronomy****1-6 Credits**

Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**AGRO 700. Doctoral Dissertation****15 Credits**

Dissertation.

## Environmental Science Courses

**E S 110G. Introductory Environmental Science****4 Credits (3+2P)**

Introduction to environmental science as related to the protection, remediation, and sustainability of land, air, water, and food resources.

Emphasis on the use of the scientific method and critical thinking skills in understanding environmental issues.

**E S 256. Environmental Engineering and Science****3 Credits**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control.

Restricted to: Main campus, Alamogordo campus, Grants campus, Carlsbad campus. Crosslisted with: C E 256

**Prerequisite(s):** CHEM 111G and MATH 191G.

**E S 256 L. Environmental Science Laboratory****1 Credit**

Laboratory experiments associated with the material presented in

E S 256. Same as C E 256L.

**Corequisite:** E S 256.

**E S 300. Special Topics****1-4 Credits**

Special subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester.

Restricted to majors.

**E S 301. Principles of Ecology****3 Credits**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. Crosslisted with: BIOL 301

**Prerequisite(s):** BIOL 111G, A ST 311, and grade of C or better in MATH 191G or Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 191G.

**E S 312. Emergency Response to Hazardous Material Incidents****2 Credits**

EPA approved Environmental Response Training Program Course 165.15. In compliance with OSHA 29 CFR 1910.120. Normally taken during last year of study. Same as E T 312 and WERC 312.

**Prerequisite:** consent of instructor.

**E S 330. Environmental Management Seminar I****1 Credit**

Restricted to: Main campus only. Crosslisted with: A EN 330, C E 330, E E 330, I E 330, M E 330, WERC 330 and CH E 330.

**E S 361. Basic Toxicology****3 Credits**

Same as TOX 361.

**Prerequisite:** CHEM 110G or CHEM 112G and BIOL 110G.

**E S 370. Environmental Soil Science****3 Credits**

Continuation of SOIL 252 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as SOIL 370.

**Prerequisite:** SOIL 252.

**E S 391. Internship****3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**E S 422. Environmental Chemistry****3 Credits**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: CHEM 422

**Prerequisite(s):** CHEM 112G and either CHEM 211 or CHEM 313.

**E S 430. Environmental Management Seminar II****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 430, CH E 430, E E 430, E T 430, I E 430 and WERC 430

**E S 449. Special Problems****1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E S majors.

**E S 451. Special Topics****1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

**E S 452. Geohydrology****4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits. Crosslisted with: GEOL 452 and C E 452.

**Prerequisite(s)/Corequisite(s):** MATH 121G. **Prerequisite(s):** Junior or Senior.

**E S 460. Introduction to Air Pollution****3 Credits**

An introduction to the physics and chemistry of tropospheric air pollution including sources of air pollution, local and long-range transport, instrumentation, regulatory requirements, control technology.

**Prerequisite(s):** PHYS 215G, CHEM 112G, MATH 191G.

**E S 462. Sampling and Analysis of Environmental Contaminants****3 Credits (1+6P)**

Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Same as ENVE 462.

**Prerequisites:** E S 256.

**E S 470. Environmental Impacts of Land Use and Contaminant Remediation****3 Credits**

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: WSAM 470.

**Prerequisite(s):** E S 256, E S 370, E S 452, E S 462.

**E S 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: AGRO 485, HORT 486, SOIL 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**E S 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

**Prerequisite(s):** Master level graduate students.

**E S 599. Master's Thesis****1-15 Credits**

Thesis Graded: Thesis/Disertation.

**E S 605. Arid Land Water Resources****3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. Students will develop literature reviews, draft proposals, and conduct presentations. May be repeated up to 3 credits. Crosslisted with: WSAM 605.

**E S 696. Doctors Proposal****1 Credit**

Current research proposal written by PhD level graduate students. Consent of Instructor required. Crosslisted with: AGRO 696, HORT 696 and SOIL 696. Restricted to: Doctors PLEN majors.

**Prerequisite(s):** PhD level graduate students.

**E S 700. Doctoral Dissertation****1-15 Credits**

Dissertation Graded: Thesis/Disertation.

## Genetics Courses

**GENE 110. Experimental Systems in Genetics****1 Credit**

Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.

**GENE 303V. Genetics and Society****3 Credits**

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: AGRO303V.

**GENE 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, ANSC 305, BIOL 305 and HORT 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**GENE 305 L. Genetic Techniques****1 Credit**

Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics. Pre/

**Corequisite(s):** GENE 315, or AGRO/ANSC/BIOL/HORT 305.

**GENE 315. Molecular Genetics****3 Credits**

Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics.

**Prerequisite(s)/Corequisite(s):** . Prerequisite(s): CHEM 112 and BIOL 211. Recommend CHEM 313.

**GENE 320. Hereditary and Population Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.

**Prerequisite(s):** CHEM 111G & BIOL 211G.

**GENE 391. Genetics Laboratory****1-6 Credits (1-6)**

Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**GENE 440. Genetics Seminar****1 Credit**

Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology. Consent of instructor required.

**Prerequisite(s):** Seniors only; GENE 315 & GENE 320.

**GENE 449. Special Problems****1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

**GENE 450. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

**GENE 452. Applied Bioinformatics****3 Credits**

Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.

**GENE 486. Genes and Genomes****3 Credits**

Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

**GENE 488. Gene Regulation****3 Credits**

Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315.

## Horticulture Courses

**HORT 100G. Introductory Plant Science****4 Credits (3+2P)**

Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 100G.

**HORT 110. Athletic Field and Golf Course Management****1 Credit**

Survey of proper management of athletic fields, golf courses and other turfgrass stands. Career opportunities in athletic field and golf course management will be discussed. Course includes field trips to local and regional sports turf facilities.

**HORT 200. Special Topics****1-4 Credits**

Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

**HORT 205. Introduction to Horticulture****3 Credits**

Principles and practices of horticulture. Basic chemical, physical, and biological principles that govern plant growth in different environments. Economics of plant science as related to the field of horticulture. Online course entirely. Intended for non-majors.

**HORT 210. Ornamental Plants I****4 Credits (3+2P)**

Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.

**HORT 211. Ornamental Plants II****4 Credits (3+2P)**

Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.

**HORT 240. Floral Quality Evaluation and Design****2 Credits (1+2P)**

Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.

**HORT 241. Floriculture Field Practicum****1 Credit**

Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.

**Prerequisite(s):** HORT 240 or consent of instructor.

**HORT 250. Plant Propagation****3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 250.

**HORT 300. Special Topics****1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**HORT 302V. Forestry and Society****3 Credits**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.

**HORT 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, ANSC 305, BIOL 305 and GENE 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**HORT 307. Landscape Design****3 Credits (1+4P)**

Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques. Prerequisites : HORT 210 or HORT 211 or concurrent enrollment or consent of instructor.

**HORT 310. Medicinal Herbs****3 Credits**

Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.

**HORT 315. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 315

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**HORT 365. Principles of Crop Production****4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Crosslisted with: AGRO 365

**Prerequisite(s):** AGRO/HORT 100, CHEM 111G or equivalent and MATH 120 or equivalent.

**HORT 377. Introduction to Turfgrass Management****4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease insects and turfgrass varieties. Crosslisted with: AGRO 377

**HORT 378. Turfgrass Science****4 Credits (3+3P)**

Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology.

**Prerequisite(s):** HORT 377 or consent of instructor.

**HORT 391. Internship****1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

**HORT 447. Seminar****1 Credit**

Review of current literature. Same as AGRO 447 and SOIL 447.

**HORT 449. Special Problems****1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**HORT 450. Special Topics****1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

**HORT 462. Plant Breeding****3 Credits**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

**HORT 465. Landscape Construction and Maintenance****4 Credits (3+2P)**

Application of landscape design and construction principles to build and maintain residential, small commercial and selected public managed landscapes.

**HORT 471. Plant Mineral Nutrition****3 Credits**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471.

**Prerequisite:** EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

**HORT 479. Advanced Turfgrass Science****3 Credits**

Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.

**Prerequisite:** HORT 378 or consent of instructor.

**HORT 485. Vegetable Crop Management****4 Credits (3+2P)**

Physiological, environmental and cultural aspects of vegetable crop production.

**Corequisite(s):** AGRO 365 or HORT 365, or consent of instructor.

**HORT 486. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: AGRO 485, SOIL 485, E S 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**HORT 488. Greenhouse Management****4 Credits (3+3P)**

Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.

**Prerequisite(s):** HORT/AGRO 365 or consent of instructor.

**HORT 492. Diagnosing Plant Disorders****3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.

**Prerequisites:** EPWS 303 and EPWS 310.

**HORT 500. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**HORT 505. Research Orientation****4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505 and SOIL 505

**HORT 506. Plant Genetics****3 Credits**

Advanced treatment of the principles of classical genetics and heredity with emphasis on the nature and action of the gene including molecular analysis. May be repeated up to 3 credits. Crosslisted with: AGRO 506. CHEM 345 recommended.

**Prerequisite(s):** AGRO/GENE/HORT/BIOL/ANSC 305 or consent of instructor.

**HORT 514. Soil-Plant Relationships****3 Credits**

Physical, chemical, and biological soil environment as it affects plant and crop growth. Same as AGRO/SOIL 514.

**Prerequisites:** BIOL 314, SOIL 252.

**HORT 515. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 515

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**HORT 525. Scientific Writing How to be a Productive and Effective Writer 1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

**HORT 533. Environmental Physiology of Plants****3 Credits**

Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Same as AGRO/BIOL 533.

**Prerequisite:** BIOL 314 or consent of instructor.

**HORT 590. Graduate Seminar****1 Credit**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

**HORT 595. Internship****1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

**HORT 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, E S 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

**Prerequisite(s):** Master level graduate students.

**HORT 597. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and SOIL 597

**HORT 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**Prerequisite:** consent of instructor.

**HORT 599. Master's Thesis****15 Credits**

Thesis.

**HORT 609. Breeding for Plant Disease Resistance****3 Credits**

A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. Same as AGRO 609.

**HORT 610. Advanced Crop Breeding****4 Credits (3+3P)**

Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. Same as AGRO 610.

**Prerequisite:** AGRO 462 or consent of instructor.

**HORT 620. Instrumentation in Agronomy****3 Credits**

Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as AGRO/SOIL 620.

**HORT 625. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students in the 625 course will be required to perform additional research than those students in the 525 cross-listing Crosslisted with: AGRO 525, EPWS 525, HORT 525 and SOIL 525.

**HORT 696. Doctors Proposal****1 Credit**

Current research proposal written by PhD level graduate students. Consent of Instructor required. Crosslisted with: AGRO 696, E S 696 and SOIL 696. Restricted to: Doctors PLEN majors.

**Prerequisite(s):** PhD level graduate students.

**HORT 697. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 697 and SOIL 697

## Soil Courses

**SOIL 200. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

**SOIL 252. Soils****3 Credits**

Origin, classification, morphology, and physical, chemical, and biological properties of soils.

**Prerequisite:** CHEM 111G and CHEM 112G.

**SOIL 252 L. Soils Laboratory****1 Credit**

Morphological, chemical, physical and biological properties of soil in the laboratory and field.

**Corequisite:** SOIL 252.

**SOIL 300. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**SOIL 312. Soil Management and Fertility****3 Credits**

Management, conservation, and fertility of soils; physical conditions affecting growth, nutrition, and plant production.

**Prerequisite:** SOIL 252.

**Corequisite:** SOIL 312L.

**SOIL 312 L. Soil Management and Fertility Lab****1 Credit**

Hands-on experience. Includes field trips, videos, calculations, visiting lecturers and other lab activities as possible.

**Prerequisite:** SOIL 252.

**Corequisite:** SOIL 312.

**SOIL 370. Environmental Soil Science****3 Credits**

Continuation of SOIL 252 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as E S 370.

**Prerequisite:** SOIL 252.

**SOIL 391. Internship****1-6 Credits (1-6)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**SOIL 424. Soil Chemistry****3 Credits**

Basic elements of soil chemistry including clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

**Prerequisite(s):** SOIL 252L or CHEM 111G and 112G.

**SOIL 447. Seminar****1 Credit**

Organization, preparation, and presentation of current topics in agronomy, horticulture, and soil science. Same as AGRO/HORT 447.

**SOIL 449. Special Problems****1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**SOIL 450. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree. May be repeated up to 9 credits. Consent of Instructor required.

**SOIL 456. Irrigation and Drainage****3 Credits**

Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.

**SOIL 472. Soil Morphology and Classification****4 Credits (2+2P)**

Terminology used to describe soils. Soil classification systems of the world with emphasis on systems used in the United States. Theory of classification and taxonomy as applied to soils. May be repeated up to 4 credits. Crosslisted with: GEOG 472.

**Prerequisite(s):** SOIL 252.

**SOIL 476. Soil Microbiology****3 Credits**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 252 and BIOL 311 recommended. Same as BIOL 476.

**SOIL 476 L. Soil Microbiology Laboratory****1 Credit**

Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as BIOL 476L.

**Prerequisites:** SOIL 476 or concurrent enrollment.

**SOIL 477. Environmental Soil Physics****3 Credits**

A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.

**SOIL 477 L. Environmental Soil Physics Laboratory****1 Credit**

Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity.

**Prerequisite:** SOIL 252.

**SOIL 479. Environmental Soil Chemistry****3 Credits**

Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

**Prerequisite(s):** SOIL 252L or CHEM 111G and 112G.

**SOIL 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: AGRO 485, HORT 486, E S 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**SOIL 500. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**SOIL 505. Research Orientation****4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505 and HORT 505

**SOIL 514. Soil-Plant Relationships****3 Credits**

Physical, chemical, and biological soil environment as it affects plant and crop growth. Same as AGRO/HORT 514.

**Prerequisites:** BIOL 314, SOIL 252.

**SOIL 525. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, HORT 525, HORT 625, SOIL 625 and EPWS 525.

**SOIL 590. Graduate Seminar****1 Credit**

Current research discussions presented by master level graduate students. Not more than one credit toward the degree. Same as AGRO/HORT 590. Crosslisted with: AGRO 590 and HORT 590.

**SOIL 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, E S 596, GENE 596 and HORT 596. Restricted to: Masters HORT; Masters PLEN majors.

**Corequisite(s):** Master level graduate students.

**SOIL 597. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and HORT 597

**SOIL 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**SOIL 600. Doctoral Research****1-15 Credits**

Research.

**SOIL 625. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students in the 625 course will be required to perform additional research than those students in the 525 cross-listing Crosslisted with: AGRO 525, HORT 525 and EPWS 525.

**SOIL 630. Advanced Soil Classification****3 Credits**

Philosophy and organization of various soil classification systems, some international in scope, with emphasis on the new USDA system and classroom and field experience in using this system.

**Prerequisite:** SOIL 472 or consent of instructor.

**SOIL 650. Advanced Topics****1-3 Credits**

Colloquium on contemporary topics associated with agriculture, environmental science and engineering. Multidisciplinary topics will be chosen to encourage participation of students from diverse disciplines. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**SOIL 652. Advanced Soil Physics****3 Credits**

Advanced treatment of soil physics, modeling, includes working on an existing/new research project, modeling existing or new data, step by step guide on the use of some 1-D and 2-D models. Specific areas of specialization will be field scale variability of soil properties, water flow, solute transport, and plant water relations.

**Prerequisite(s):** SOIL 477 and computer literacy; or consent of instructor.

**SOIL 655. Moisture Heat Contaminant Transport Modeling****3 Credits**

Provides clear coverage of the basic principles of heat, moisture and contaminant transport through porous media, and a step-by-step guidance and hands on application on the use of some spreadsheet based and physically based one-and two-dimensional transport models. A similar course does not exist in the college for students that can encourage them to pursue modeling as a means of solving vadose zone and groundwater contamination and remediation problems. Consent of instructor required.

**SOIL 694. Doctoral Seminar****1 Credit**

Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. Same as AGRO 694.

**Prerequisite:** doctoral level graduate students.

**SOIL 696. Doctoral Proposal****1 Credit**

Current research proposal written by doctoral level graduate students. Not more than 1 credit toward the degree. Same as AGRO 696.

**Prerequisite:** doctoral level graduate students.

**SOIL 697. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 697 and HORT 697

**SOIL 698. Topics in Agronomy****1-6 Credits**

Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**Office Location:** Skeen Hall room N127

**Phone:** (575) 646-3405

**Website:** <http://aces.nmsu.edu/academics/pes/>

## Agronomy - Bachelor of Science in Agriculture

Agronomy is an understanding of the principles of plant and soil science and an application of these principles in the production of crops. Commercial sector careers include positions in agricultural consulting companies, agricultural seed or chemical companies, research and development with commercial companies, as well as farm and/or ranch management. Careers in county, state or federal agencies are in the areas of USDA, Cooperative Extension Service, Natural Resources Conservation Service, Forest Service and Bureau of Land Management.

The Agronomy major has two concentrations that are available, Crop Consulting and General Agronomy. In addition to the completion of the requirements of the major listed above, you must elect a concentration and complete 25 credits from the requirements for that option. To deviate from the courses required within a concentration, you must file a formal petition, subject to approval by departmental committee. You should develop a specific program of study in consultation with a departmental agronomy advisor.

**Requirements****Agronomy and Soil Science Courses <sup>1</sup>**

AGRO 100G	Introductory Plant Science	4
AGRO 305	Principles of Genetics	3
AGRO 365	Principles of Crop Production	4
AGRO 447	Seminar	1
AGRO 483	Sustainable Production of Agronomic Crops	4
SOIL 252	Soils	3
SOIL 252 L	Soils Laboratory	1
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1

**Other Required Courses**

A ST 311	Statistical Applications	3
AG E 250	Technology and Communication for Business Management	3
AGRO 449	Special Problems	1-3
BIOL 111G & BIOL 211G	Natural History of Life and Cellular and Organismal Biology	6
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4
Select 3 credits from MATH – to equal the proficiency level of MATH 142G or MATH 121G		3
Select one from the following:		4
EPWS 303	Economic Entomology	
EPWS 310	Plant Pathology	
EPWS 311	Introduction to Weed Science	

**Program Concentrations**

Crop Consulting or General Agronomy Concentration	25
<b>Total Credits</b>	<b>81-83</b>

<sup>1</sup> requires a grade of C- or above in agronomy and soil science courses

## Concentration: Crop Consulting

**Required Courses**

AG E 236	Principles of Food and Agribusiness Management	3
AG E 315V	World Agriculture and Food Problems	3
AG E 450	Spreadsheet Applications in Food and Agriculture	3
AGRO 311	Introduction to Weed Science	4
AGRO 365	Principles of Crop Production (mandatory course)	4
AGRO 462	Plant Breeding (mandatory course)	3

AGRO 483	Sustainable Production of Agronomic Crops (mandatory course)	4
AGRO 492	Diagnosing Plant Disorders (mandatory course)	3
B A 202	Small Business Enterprise	3
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 373	Fungal Biology	3
HORT 471	Plant Mineral Nutrition	3
HORT 485	Vegetable Crop Management	4
SOIL 456	Irrigation and Drainage	3
SOIL 476	Soil Microbiology	3
SPAN 111	Elementary Spanish I	4
SPAN 211	Intermediate Spanish I	3
Total Credits		59

## Concentration: General Agronomy

### Required Courses

AG E 236	Principles of Food and Agribusiness Management	3
AG E 305	Marketing and Food Agricultural Products	3
AG E 315V	World Agriculture and Food Problems	3
AGRO 391	Internship	1-6
AGRO 471	Plant Mineral Nutrition (mandatory course)	3
AGRO 492	Diagnosing Plant Disorders (mandatory course)	3
BIOL 312	Plant Taxonomy	3
BIOL 313	Structure and Function of Plants (mandatory course)	3
BLAW 316	Legal Environment of Business	3
EPWS 314	Plant Physiology	3
HORT 250	Plant Propagation	3
HORT 485	Vegetable Crop Management	4
RGSC 294	Rangeland Resource Management	3
RGSC 325	Rangeland Restoration Ecology	3
SOIL 456	Irrigation and Drainage	3
Total Credits		44-49

## Environmental Science - Bachelor of Science in Environmental Science

The environmental science major is a multidisciplinary program based on a strong general science curriculum and an environmental curriculum that focuses on environmental problems and solutions. Although administered by the Department of Plant and Environmental Sciences, a multidisciplinary advisory committee recommends curriculum and other changes to the program. Graduates are very competitive for careers in industry and government and have excellent preparation for graduate programs in a variety of fields. A grade of C- or better must be earned in the Basic Background and Core Requirements.

### Requirements

#### Basic Science Background

A ST 311	Statistical Applications	3
BIOL 111G	Natural History of Life	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 311	General Microbiology	3
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4
GEOL 111G	Introductory Geology	4
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
PHYS 215G	Engineering Physics I	3
SOIL 252	Soils	3
SOIL 252 L	Soils Laboratory	1
<i>Environmental Science Core</i>		
E S 110G	Introductory Environmental Science	4
E S 256	Environmental Engineering and Science	3
E S 256 L	Environmental Science Laboratory	1
E S 301	Principles of Ecology	3
E S 312	Emergency Response to Hazardous Material Incidents	2
E S 330	Environmental Management Seminar I	1
E S 361	Basic Toxicology	3
E S 370	Environmental Soil Science	3
E S 391	Internship	3
E S 422	Environmental Chemistry	3
E S 430	Environmental Management Seminar II	1
E S 452	Geohydrology	4
E S 460	Introduction to Air Pollution	3
E S 462	Sampling and Analysis of Environmental Contaminants	3
E S 470	Environmental Impacts of Land Use and Contaminant Remediation	3
FWCE 434 or FWCE 459	Aquatic Contaminants and Toxicology Aquatic Ecology	4
Total Credits		87

## Genetics and Biotechnology - Bachelor of Science in Genetics

### Codirectors of the Program:

**Professor,** Michelle Nishiguchi, Department Head, Biology

**Professor,** Rolston St. Hilaire, Department Head, Plant and Environmental Sciences

**Professors** Bosland, Cramer, Houde, Milligan, Nishiguchi, O'Connell, Ray, Sengupta-Gopalan, C. Shuster, St. Hilaire, Zhang; **Associate Professors** Bailey, Curtiss, M. Shuster

Have you ever wondered why your hair or eye color, facial features, or the build of your body resembles that of your parents, grandparents, or other close relatives? What factors are responsible for generating all the variety of colors and shapes of flowers, trees, and different types of animals? If these questions have crossed your mind, then you have been thinking about Genetics; the science of heredity. Genetics is studied at the DNA/

gene/genome level (molecular genetics, biotechnology, genomics and bioinformatics), the level of organisms (classical or Mendelian genetics), and within/among populations of individuals (population and quantitative genetics).

One of the most significant scientific accomplishments in history has been the use of genomic technologies to recently identify most human genes, as well as, most genes for a number of other animals, plants, fungi, and bacteria. Geneticists now have tremendous opportunities to use molecular, biochemical, mathematical, and computer science-based (bioinformatics) approaches to investigate how these genes determine observable traits. This information can be used to significantly advance human health and well being, and to meet the food and fiber needs of the world.

A degree in Genetics can provide excellent preparation for careers in academic research and technical support, teaching, agriculture, the biotechnology industry, medicine and health sciences, forensic science, technical writing, and sales or marketing. It is also an excellent background for students wishing to enter a graduate program, medical school, and veterinary school.

Undergraduates in the Genetics program must earn a grade of C- or better to receive credit for required Basic Science Background and Genetics Core courses. Within the Genetics Core curriculum, Tier I courses must be taken by all majors, for a total of 28 credit hours. To accommodate differing interests among students, a series of Tier II courses comprising 11 to 13 credits are provided. Ethical considerations of genetic based technologies will be infused throughout the curriculum, with a focused course on Science and Ethics in the Tier III portion of the core curriculum.

## Requirements

### General Education Requirements

#### Area I: Communications

English Composition-Level 1. Select one from the following: 4

ENGL 111G	Rhetoric and Composition
ENGL 111GH	Rhetoric and Composition Honors
SPCD 111G	Advanced ESL Composition
ENGL 111 M	Rhetoric and Composition for International and Multilingual Students

English Composition-Level 2:

ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	

Oral Communication. Select one from the following: 3

AXED 201G	Effective Leadership and Communication in Agricultural Organizations
COMM 253G	Public Speaking
COMM 265G	Principles of Human Communication
HON 265G	Principles of Human Communication Honors

#### Area II: Mathematics/Algebra

MATH 191G	Calculus and Analytic Geometry I	4
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#### Area III: Laboratory Science

CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4

#### Area IV & V: Social/Behavioral Sciences and Humanities and Fine Arts

Select a total of 15 credits combined from Areas IV and V, with 6 credits in one area and 9 credits in the other area: <sup>1</sup> 15

Area IV: Social/Behavioral Sciences: Select 6-9 credits <sup>a</sup>

Area V: Humanities and Fine Arts: Select 6-9 credits <sup>1</sup>

### Viewing a Wider World

Select one Viewing a Wider World course <sup>2</sup> 6

### Basic Science Background Requirements

A ST 311	Statistical Applications	3
or BIOL 455	Biometry	
BCHE 395	Biochemistry I	3
BCHE 396	Biochemistry II	3
BIOL 111G	Natural History of Life	3
CHEM 111G	General Chemistry I	4
or CHEM 115	Principles of Chemistry I	
CHEM 112G	General Chemistry II	4
or CHEM 116	Principles of Chemistry II	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
PHYS 211G	General Physics I	3
or PHYS 221G	General Physics for Life Sciences I	
PHYS 212G	General Physics II	3
or PHYS 222G	General Physics for Life Sciences II	

### Core Requirements

#### Tier I Courses

GENE 110	Experimental Systems in Genetics	1
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
GENE 305 L	Genetic Techniques	1
GENE 315	Molecular Genetics	3
GENE 320	Hereditary and Population Genetics	3
BIOL 377	Cell Biology	3
GENE 440	Genetics Seminar	1
GENE 452	Applied Bioinformatics	3
or BIOL 446	Bioinformatics and NCBI Database	
BCHE 494	Biochemical Genetics Laboratory	3
or BIOL 302	Molecular Biology Techniques Laboratory	

#### Tier II Courses

Select one course from each of the following four areas: 12-14

Selection response:

AGRO 462	Plant Breeding
ANSC 423	Animal Breeding
BIOL 467	Evolution

Physiology:

ANSC 421	Physiology of Reproduction
BIOL 354	Physiology of Humans
BIOL 381	Animal Physiology

BIOL 385	An Introduction to Cancer
BIOL 451	Physiology of Microorganisms
BIOL 474	Immunology
EPWS 314	Plant Physiology
HORT 471	Plant Mineral Nutrition
Organism Structure:	
ANSC 370	Anatomy and Physiology of Farm Animals
BIOL 313	Structure and Function of Plants
BIOL 322	Zoology
BIOL 382	Plant Signalling and Development
BIOL 470	Developmental Biology
BIOL 465	Invertebrate Zoology
EPWS 303	Economic Entomology
Molecular Genetics:	
BIOL 475	Virology
BIOL 478	Molecular Biology of Microorganisms
GENE 486	Genes and Genomes
GENE 488	Gene Regulation
<i>Tier III Courses</i>	3
Select one from the following:	
AGRO 303V	Genetics and Society
HON 306V	Science, Ethics and Society
PHIL 321	Biomedical Ethics
<b>Additional Courses</b>	
Select electives to bring total to 120 credits including 48 upper division credits.	
<i>Recommended Electives (Honors College)</i>	
HON 400	Honors Thesis
Select 9 credits from the following:	
HON 205G	Life, Energy, and Evolution
HON 214	Successful Fellowship Writing
Select 6 credits from the following:	
HON 306V	Science, Ethics and Society
HON 314	Successful Fellowship Writing
HON 410	Honors Internship
Total Credits	127-129

<sup>1</sup> Total of 15 credits combined between Areas IV and V, with 6 credits in one area and 9 credits in the other area. See General Education Courses (p. 46) for listing of available courses.

<sup>2</sup> One VWW area will be satisfied using the nine-hour rule. Students with Biology as their home department will use GENE courses and students with Plant and Environmental Science as their home department use BIOL courses.

## Horticulture - Bachelor of Science in Agriculture

Horticulture includes a wide variety of topics that relate to fruit, vegetable and ornamental crops. Careers range from production management to processing and marketing, retail and wholesale management, greenhouse and nursery production, floriculture, landscaping, turf management,

research and development, various service activities and positions with local, state and federal agencies.

### Required Courses

BIOL 111G	Natural History of Life	3
or BIOL 211G	Cellular and Organismal Biology	
Select one from the following		8
CHEM 111G & CHEM 112G	General Chemistry I and General Chemistry II	
EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4
EPWS 314	Plant Physiology	3
HORT 447	Seminar	1
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 121G	College Algebra	
SOIL 252	Soils	3

### Horticulture Courses

Select at least 29 credits from the following: <sup>1</sup>		29
HORT 100G	Introductory Plant Science	
HORT 200	Special Topics	
HORT 205	Introduction to Horticulture	
HORT 210	Ornamental Plants I	
HORT 211	Ornamental Plants II	
HORT 240	Floral Quality Evaluation and Design	
HORT 241	Floriculture Field Practicum	
HORT 250	Plant Propagation	
HORT 300	Special Topics	
HORT 302V	Forestry and Society	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	
HORT 365	Principles of Crop Production	
HORT 377	Introduction to Turfgrass Management	
HORT 391	Internship	
HORT 447	Seminar	
HORT 449	Special Problems	
HORT 450	Special Topics	
HORT 462	Plant Breeding	
HORT 465	Landscape Construction and Maintenance	
HORT 471	Plant Mineral Nutrition	
HORT 485	Vegetable Crop Management	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	

### Program Concentrations <sup>2</sup>

Select one from the following concentrations:		24-44
Crop Consulting		
General Horticulture		
Horticulture Business		
Landscape Design		
Ornamental Horticulture		

Total Credits

81-101

- <sup>1</sup> requires a grade of C- or above in horticulture courses
- <sup>2</sup> Five concentrations are available in the horticulture major. In addition to the completion of the requirements of the major listed above, you must elect a concentration and complete the requirements for that concentration. You should develop a specific program of study in consultation with a departmental horticulture advisor. To deviate from the courses required within a concentration, you should develop a specific program of study in consultation with a departmental horticulture advisor.

If you want to apply for certification as a professional horticulturist, you should also complete:

HORT 305	Principles of Genetics	3
BCHE 341	Survey of Biochemistry	4
or CHEM 211	Organic Chemistry	
Total Credits		7

## Concentration: Crop Consulting

### Required Courses

Select 13-14 credits from the following:		13-14
HORT 365	Principles of Crop Production	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 485	Vegetable Crop Management	
HORT 492	Diagnosing Plant Disorders	
Select 24-27 credits from the following:		24-27
AG E 236	Principles of Food and Agribusiness Management	
AG E 250	Technology and Communication for Business Management	
AG E 315V	World Agriculture and Food Problems	
AG E 450	Spreadsheet Applications in Food and Agriculture	
AGRO 311	Introduction to Weed Science	
AGRO 483	Sustainable Production of Agronomic Crops	
B A 202	Small Business Enterprise	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
EPWS 373	Fungal Biology	
EPWS 455	Advanced Integrated Pest Management	
EPWS 481	Plant Nematology	
FSTE 320	Food Microbiology	
FSTE 421	Food Chemistry	
SOIL 312	Soil Management and Fertility	
SOIL 456	Irrigation and Drainage	
SOIL 476	Soil Microbiology	
SPAN 111	Elementary Spanish I	
SPAN 211	Intermediate Spanish I	
Total Credits		37-41

## Concentration: General Horticulture

### Required Courses

Select 12-16 credits from the following:		12-16
A ST 311	Statistical Applications	
BCHE 341	Survey of Biochemistry	
CHEM 211	Organic Chemistry	
HORT 210	Ornamental Plants I	
HORT 211	Ornamental Plants II	
HORT 250	Plant Propagation	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 315	Crop Physiology	
HORT 365	Principles of Crop Production	
HORT 462	Plant Breeding	
HORT 465	Landscape Construction and Maintenance	
HORT 471	Plant Mineral Nutrition	
HORT 485	Vegetable Crop Management	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	
Select 20-28 credits from the following:		20-28
A ST 311	Statistical Applications	
A ST 456	Statistical Methods and Data Analysis	
ACCT 221	Principles of Accounting I (Financial)	
ACCT 222	Principles of Accounting II (Managerial)	
AG E 236	Principles of Food and Agribusiness Management	
AG E 250	Technology and Communication for Business Management	
AG E 305	Marketing and Food Agricultural Products	
AG E 315V	World Agriculture and Food Problems	
AG E 425	Food and Agribusiness Financial Management	
AG E 450	Spreadsheet Applications in Food and Agriculture	
AGRO 303V	Genetics and Society	
AGRO 311	Introduction to Weed Science	
AGRO 483	Sustainable Production of Agronomic Crops	
ANSC 423	Animal Breeding	
ART 150	Drawing I	
or ART 151	Drawing II	
AXED 331	Agricultural Structures	
BCHE 396	Biochemistry II	
BCHE 397	Experimental Biochemistry Laboratory	
BCHE 494	Biochemical Genetics Laboratory	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
BIOL 467	Evolution	
BIOL 478	Molecular Biology of Microorganisms	
BLAW 316	Legal Environment of Business	
BLAW 385V	Consumers and the Law	
BUSA 111	Introduction to Business	
ECON 251G	Principles of Macroeconomics	

ECON 252G	Principles of Microeconomics
EPWS 301	Agricultural Biotechnology
EPWS 373	Fungal Biology
EPWS 455	Advanced Integrated Pest Management
EPWS 481	Plant Nematology
E T 106	Drafting Concepts/Computer Drafting Fundamentals I
FSTE 320	Food Microbiology
FSTE 421	Food Chemistry
GENE 305 L	Genetic Techniques
HORT 449	Special Problems
HORT 462	Plant Breeding
MGT 309	Human Behavior in Organizations
MGT 315V	Human Relations in Organizations
MGT 332	Human Resources Management
MKTG 303	Principles of Marketing
MKTG 305	Marketing Food and Agricultural Products
MKTG 313	Retail Management
SOIL 312	Soil Management and Fertility
SOIL 456	Irrigation and Drainage
SOIL 476	Soil Microbiology
SPAN 111	Elementary Spanish I
SPAN 211	Intermediate Spanish I
Total Credits	32-44

## Concentration: Horticulture Business

For this option to satisfy the minor in Business Administration, nine credits must be upper division and nine credits must have one of the following prefixes: ACCT, BUSA, ECON, FIN, MGT, MKTG.

### Required Courses

Select 8 from the following:	24
A ST 311	Statistical Applications
ACCT 221	Principles of Accounting I (Financial)
ACCT 222	Principles of Accounting II (Managerial)
AG E 236	Principles of Food and Agribusiness Management
AG E 250	Technology and Communication for Business Management
AG E 425	Food and Agribusiness Financial Management
AG E 450	Spreadsheet Applications in Food and Agriculture
BLAW 316	Legal Environment of Business
BUSA 111	Introduction to Business
ECON 251G	Principles of Macroeconomics
ECON 252G	Principles of Microeconomics
MGT 309	Human Behavior in Organizations
or MGT 315V	Human Relations in Organizations
MGT 332	Human Resources Management
MKTG 303	Principles of Marketing
MKTG 305	Marketing Food and Agricultural Products

MKTG 313	Retail Management
Total Credits	24

## Concentration: Landscape Design

### Required Courses

HORT 210	Ornamental Plants I	4
HORT 211	Ornamental Plants II	4
HORT 307	Landscape Design	3
HORT 465	Landscape Construction and Maintenance	4
Select 24-26 credits from the following		24-26
AG E 236	Principles of Food and Agribusiness Management	
AG E 250	Technology and Communication for Business Management	
or C S 110	Computer Literacy	
ART 150	Drawing I	
or ART 151	Drawing II	
AXED 331	Agricultural Structures	
BLAW 316	Legal Environment of Business	
BLAW 385V	Consumers and the Law	
E T 106	Drafting Concepts/Computer Drafting Fundamentals I	
MGT 315V	Human Relations in Organizations	
MKTG 303	Principles of Marketing	
SOIL 456	Irrigation and Drainage	
SPAN 111	Elementary Spanish I	
Total Credits		39-41

## Concentration: Ornamental Horticulture

### Required Courses

HORT 210	Ornamental Plants I	4
or HORT 211	Ornamental Plants II	
HORT 250	Plant Propagation	3
HORT 365	Principles of Crop Production	4
HORT 488	Greenhouse Management	4
Select 24-25 credits from the following: <sup>3</sup>		24-25
AG E 236	Principles of Food and Agribusiness Management	
AG E 250	Technology and Communication for Business Management	
AG E 305	Marketing and Food Agricultural Products	
AG E 425	Food and Agribusiness Financial Management	
AGRO 311	Introduction to Weed Science	
B A 202	Small Business Enterprise	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
BLAW 230	Business Law	
BLAW 316	Legal Environment of Business	
C S 110	Computer Literacy	
HORT 391	Internship	

MGT 309	Human Behavior in Organizations	
MGT 315V	Human Relations in Organizations	
MKTG 303	Principles of Marketing	
MKTG 313	Retail Management	
SOIL 312	Soil Management and Fertility	
Total Credits		39-40

<sup>3</sup> or similar alternative courses with same prefix and level after consultation with advisor

## Soil Science - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behaviors of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

### Requirements

In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences. You must also meet university general education requirements. At least 24 credits of soil science related courses with a grade of C- or above including:

#### Required Courses

SOIL 252	Soils	3
SOIL 252 L	Soils Laboratory	1
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
SOIL 447	Seminar	1
Select 12-13 credits from the following:		12-13
SOIL 424	Soil Chemistry	3
SOIL 456	Irrigation and Drainage	3
SOIL 472	Soil Morphology and Classification	4
SOIL 476	Soil Microbiology	3
SOIL 477	Environmental Soil Physics	3

#### Other Required Courses

Select two from the following:		6
BIOL 111G	Natural History of Life	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 311	General Microbiology	3
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
GEOL 111G	Introductory Geology	4
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 211G	General Physics I	3
Total Credits		70-71

## Soil Science Concentrations

Three concentrations are available in soil science. In each case, your academic advisor has a list of appropriate courses.

### Concentration: Environment and Resource Management

Soil science is integrated into the management of the environment and natural resources. Students interested in careers of conservation, environmental management, urban planning, waste disposal and related fields in government and industry may choose from a variety of course offerings. The economic and social implications as well as the technological aspects of resource management are included in the option courses.

**You must select one course from each of the four following subject matter areas and a total of at least ten courses:** 30

<i>Soil, Water, Wildlife or Range Conservation and Economics</i>	
A EN 478	Irrigation and Drainage Engineering
C E 256	Environmental Engineering and Science
C E 331	Fluid Mechanics and Hydraulics
C E 356	Fundamentals of Environmental Engineering
C E 357	Soil Mechanics
C E 482	Hydraulic Structures
C E 483	Surface Water Hydrology
RGSC 294	Rangeland Resource Management
RGSC 318	Watershed Management
RGSC 325	Rangeland Restoration Ecology
RGSC 440	Rangeland Resource Ecology
RGSC 460	Rangeland and Natural Resource Planning and Management
Any SOIL Course	
Any FWCE course numbered 255-499	
<i>Ecology, Plant Biology or Crop Production:</i>	
AGRO 311	Introduction to Weed Science
AGRO 315	Crop Physiology
AGRO 365	Principles of Crop Production
AGRO 462	Plant Breeding
AGRO 471	Plant Mineral Nutrition
AGRO 483	Sustainable Production of Agronomic Crops
AGRO 492	Diagnosing Plant Disorders
BIOL 301	Principles of Ecology
BIOL 312	Plant Taxonomy
BIOL 314	Plant Physiology
BIOL 408	Ecology of Plants
BIOL 462	Conservation Biology
BIOL 470	Developmental Biology
BIOL 473	Ecology of Microorganisms
BIOL 477	Applied and Environmental Microbiology
EPWS 303	Economic Entomology
EPWS 310	Plant Pathology
EPWS 311	Introduction to Weed Science
EPWS 373	Fungal Biology
EPWS 455	Advanced Integrated Pest Management

EPWS 462	Parasitology
EPWS 481	Plant Nematology
EPWS 486	Plant Virology
EPWS 492	Diagnosing Plant Disorders
HORT 205	Introduction to Horticulture
HORT 250	Plant Propagation
HORT 307	Landscape Design
HORT 310	Medicinal Herbs
HORT 465	Landscape Construction and Maintenance
HORT 471	Plant Mineral Nutrition
HORT 485	Vegetable Crop Management
HORT 488	Greenhouse Management
TOX 361	Basic Toxicology
TOX 461	Toxicology I

**Earth, Mineral or Climatic Resources:**

AG E 315V	World Agriculture and Food Problems
AG E 337V	Natural Resource Economics
AG E 384V	Water Resource Economics
AG E 385	Applied Production Economics
AG E 456	Case Studies in Food and Agribusiness Management
Any E S course	
Any GEOG course numbered 257-499	
Any GEOL course numbered 295-499	
Any SUR course	

**Math, Statistical or Computer Sciences:**

A ST 311	Statistical Applications
Any 300-level BCIS course	
Any 300-level C S course	
Any 300-level CHEM course	
Any 300-level MATH course	
Any 300-level PHYS course	
Any STAT course numbered 311-499	

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Total Credits 30

**Concentration: Soils**

Crop production and plant growth are emphasized in the general soils option. Soil management, soil conservation, and soil reclamation are related to plant growth for those students interested in both private industry and government employment opportunities as well as farm management.

**You must select one course from each of the four following subject matter areas and a total of at least ten courses:** 30

Soil, Water and Agricultural Business Management:	
GEOG 381	Cartography and Geographic Information Systems
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)
GEOL 353	Geomorphology
GEOL 475	Geology of Mineral Resources
Any AG E course	
Any SOIL course	

**Crop Production and Protection:**

AGRO 311	Introduction to Weed Science
AGRO 365	Principles of Crop Production
AGRO 471	Plant Mineral Nutrition
AGRO 483	Sustainable Production of Agronomic Crops
AGRO 485	Materials from Biorenewable Resources
AGRO 492	Diagnosing Plant Disorders
HORT 250	Plant Propagation
HORT 307	Landscape Design
HORT 310	Medicinal Herbs
HORT 365	Principles of Crop Production
HORT 462	Plant Breeding
HORT 465	Landscape Construction and Maintenance
HORT 485	Vegetable Crop Management
Any EPWS course	

**Plant Biology and Ecology:**

BIOL 301	Principles of Ecology
BIOL 312	Plant Taxonomy
BIOL 314	Plant Physiology
BIOL 408	Ecology of Plants
BIOL 462	Conservation Biology
BIOL 470	Developmental Biology
C E 256	Environmental Engineering and Science
C E 355V	Technology and the Global Environment
RGSC 294	Rangeland Resource Management
RGSC 316	Rangeland Plants
RGSC 317	Rangeland Communities
RGSC 325	Rangeland Restoration Ecology
RGSC 357	Grass Taxonomy and Identification
RGSC 440	Rangeland Resource Ecology
RGSC 452	Vegetation Measurements for Rangeland Assessment
RGSC 460	Rangeland and Natural Resource Planning and Management

**Advanced Science, Computing and Statistics:**

A ST 311	Statistical Applications
Any 300-level BCIS course	
Any 300-level C S course	
Any 300-level CHEM course	
Any 300-level MATH course	
Any 300-level PHYS course	
Any STAT course numbered 311-499	

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Total Credits 30

**Concentration: Soil and Water Science**

The soil and water science option is for students interested in careers in water management and water quality. Employment opportunities exist with irrigation districts, consulting firms, and government agencies dealing with water management and quality. The optimum use of water in semi-arid areas is emphasized through selection of courses in the technical and social sciences.

**You must select one course from each of the four following subject matter areas and a total of at least ten courses:** 30

*Crop Production and Water Use:*

AGRO 365	Principles of Crop Production
AGRO 471	Plant Mineral Nutrition
AGRO 483	Sustainable Production of Agronomic Crops
AGRO 492	Diagnosing Plant Disorders
EPWS 311	Introduction to Weed Science
EPWS 314	Plant Physiology
HORT 307	Landscape Design
HORT 315	Crop Physiology
HORT 462	Plant Breeding
HORT 485	Vegetable Crop Management
HORT 488	Greenhouse Management

*Soil and Water Engineering and Management:*

A EN 459	Design of Water Wells/Pumping Systems
A EN 478	Irrigation and Drainage Engineering
AG E 337V	Natural Resource Economics
C E 256	Environmental Engineering and Science
C E 356	Fundamentals of Environmental Engineering
C E 357	Soil Mechanics
C E 382	Hydraulic and Hydrologic Engineering
C E 452	Geohydrology
C E 482	Hydraulic Structures
C E 483	Surface Water Hydrology
SOIL 424	Soil Chemistry
SOIL 456	Irrigation and Drainage
SOIL 477	Environmental Soil Physics
SOIL 477 L	Environmental Soil Physics Laboratory
SOIL 479	Environmental Soil Chemistry

*Ecology*

BIOL 221	Introductory Microbiology
BIOL 301	Principles of Ecology
BIOL 408	Ecology of Plants
BIOL 462	Conservation Biology
BIOL 477	Applied and Environmental Microbiology
GEOG 315V	World Agriculture and Food Problems
GEOG 357	Climatology
GEOG 435	Environmental Planning
GEOG 452	Landscape Ecology
GEOG 455	Southwest Environments
RGSC 325	Rangeland Restoration Ecology
RGSC 440	Rangeland Resource Ecology
RGSC 452	Vegetation Measurements for Rangeland Assessment
SOIL 472	Soil Morphology and Classification
SOIL 476	Soil Microbiology

*Advanced Science, Computing and Statistics:*

A ST 311	Statistical Applications
Any 300-level BCIS course	
Any 300-level C S course	

Any 300-level CHEM course	
Any 300-level MATH course	
Any 300-level PHYS course	
Any STAT course numbered 311-499	
Total Credits	30

## Turfgrass Science and Management - Bachelor of Science in Agriculture

Turfgrass managers help build, maintain, and manage golf courses, athletic fields, parks, and other recreational areas. The curriculum of each option allows you to focus on a specific segment of the turfgrass industry. All majors are required to pursue two internships with a golf course, parks department, athletic field, lawn care operator or other acceptable turfgrass segment. A grade of C- or above in all Core & Option credits is required.

### Requirements

<i>Core Requirements I</i>		
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
EPWS 311	Introduction to Weed Science	4
EPWS 314	Plant Physiology	3
HORT 377	Introduction to Turfgrass Management	4
HORT 378	Turfgrass Science	4
HORT 391	Internship (two internships)	1-6
HORT 447	Seminar	1
HORT 479	Advanced Turfgrass Science	3
MATH 121G	College Algebra	3
or MATH 142G	Calculus for the Biological and Management Sciences	
SOIL 252	Soils	3
BIOL 211G	Cellular and Organismal Biology	3
<i>Core Requirements II</i>		
Select 27 credits from the following: <sup>1</sup>		27
CHEM 211	Organic Chemistry	
EPWS 303	Economic Entomology	
EPWS 310	Plant Pathology	
HORT 100G	Introductory Plant Science	
HORT 110	Athletic Field and Golf Course Management	
HORT 210	Ornamental Plants I	
HORT 211	Ornamental Plants II	
HORT 250	Plant Propagation	
HORT 300	Special Topics	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 365	Principles of Crop Production	
HORT 450	Special Topics	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 492	Diagnosing Plant Disorders	
SOIL 252	Soils	
SOIL 252 L	Soils Laboratory	

SOIL 312	Soil Management and Fertility
SOIL 312 L	Soil Management and Fertility Lab
SOIL 424	Soil Chemistry
SOIL 456	Irrigation and Drainage
SOIL 476	Soil Microbiology
SOIL 476 L	Soil Microbiology Laboratory
SOIL 477	Environmental Soil Physics
SOIL 477 L	Environmental Soil Physics Laboratory
SPAN 212	Intermediate Spanish II

**Program Options**

Select 15-18 credits from one of the following options: 15-18

Athletic Field Management Athletics
Golf Course Management
Turfgrass Business
Turfgrass Science

Total Credits 79-87

<sup>1</sup> with a grade of C- or above in Core Requirements II

## Option: Athletic Field Management Athletics

**Required Courses**

Select 7 credits from the following: 7

BLAW 313	Sports and the Law
P E 117	Beginning Soccer
PE P 323	Racquet Sports
PE P 394	Designing Student Centered Afterschool Physical Activity Clubs

*Business*

Select two from the following: 6

AG E 236	Principles of Food and Agribusiness Management
ECON 337V	Natural Resource Economics
ECON 384V	Water Resource Economics
ECON 406	The Economics of Sports
FIN 206	Introduction to Finance
or FIN 341	Financial Analysis and Markets
MGT 315V	Human Relations in Organizations
or MGT 309	Human Behavior in Organizations
MGT 332	Human Resources Management
SPAN 212	Intermediate Spanish II

*Technical*

Select 3 credits from the following: 3

AXED 303	Small Engine Technology
HORT 300	Special Topics

Total Credits 16

## Option: Golf Course Management

**Required Courses***Business*

Select two from the following: 6

AG E 236	Principles of Food and Agribusiness Management
BLAW 313	Sports and the Law
ECON 337V	Natural Resource Economics
ECON 384V	Water Resource Economics
ECON 406	The Economics of Sports
FIN 206	Introduction to Finance
or FIN 341	Financial Analysis and Markets
MGT 315V	Human Relations in Organizations
or MGT 309	Human Behavior in Organizations
MGT 332	Human Resources Management
MKTG 354	Sports Marketing

*Science*

Select 6 credits from the following: 6

BIOL 221	Introductory Microbiology
BIOL 311	General Microbiology
BIOL 312	Plant Taxonomy
BIOL 313	Structure and Function of Plants
CHEM 211	Organic Chemistry
EPWS 303	Economic Entomology
EPWS 310	Plant Pathology
EPWS 455	Advanced Integrated Pest Management

*Technical*

Select 3 credits from the following: 3

AXED 303	Small Engine Technology
HORT 300	Special Topics

Total Credits 15

## Option: Turfgrass Business

**Required Courses***Personnel Management*

Select two from the following: 6

MGT 315V	Human Relations in Organizations
or MGT 309	Human Behavior in Organizations
MGT 332	Human Resources Management
MGT 333	Training and Development
SPAN 212	Intermediate Spanish II

*Economics and Finance*

Select one from the following: 3

ACCT 200	A Survey of Accounting
AG E 236	Principles of Food and Agribusiness Management
BLAW 313	Sports and the Law
ECON 337V	Natural Resource Economics
ECON 384V	Water Resource Economics
ECON 406	The Economics of Sports
FIN 206	Introduction to Finance
or FIN 341	Financial Analysis and Markets
MGT 351	Supply Chain Management
MKTG 203	Introduction to Marketing
or MKTG 303	Principles of Marketing

*Science and Technical*

Select 6 credits from the following:	6
AXED 303 Small Engine Technology	
CHEM 211 Organic Chemistry	
EPWS 303 Economic Entomology	
EPWS 310 Plant Pathology	
EPWS 455 Advanced Integrated Pest Management	
HORT 300 Special Topics	
Total Credits	15

## Option: Turfgrass Science

### Required Courses

#### Science I

Select 6 credits from the following:	6
A ST 311 Statistical Applications	
A ST 456 Statistical Methods and Data Analysis	
BCHE 341 Survey of Biochemistry	
BCHE 395 Biochemistry I	
BIOL 221 Introductory Microbiology	
BIOL 311 General Microbiology	
BIOL 313 Structure and Function of Plants	
CHEM 211 Organic Chemistry	

#### Science II

Select 6 credits from the following:	6
EPWS 303 Economic Entomology	
EPWS 310 Plant Pathology	
EPWS 420 Environmental Behavior of Pesticides	
EPWS 455 Advanced Integrated Pest Management	
ECON 384V Water Resource Economics	

#### Business and Technical

Select 6 credits from the following:	6
AXED 303 Small Engine Technology	
BLAW 313 Sports and the Law	
ECON 337V Natural Resource Economics	
ECON 406 The Economics of Sports	
FIN 206 Introduction to Finance	
FIN 341 Financial Analysis and Markets	
HORT 300 Special Topics	
MGT 309 Human Behavior in Organizations or MGT 315V Human Relations in Organizations	
MGT 332 Human Resources Management	
MGT 351 Supply Chain Management	
MKTG 354 Sports Marketing	
Total Credits	18

## Agronomy - Undergraduate Minor

Students majoring in subjects other than Agronomy, Horticulture, Soil Science or Turfgrass Management may pursue a minor in Agronomy. Courses in chemistry (CHEM 111G General Chemistry I/CHEM 112G General Chemistry II) and Biology (BIOL 211G Cellular and Organismal Biology) are prerequisites for several of the courses.

### Required Courses

AGRO 100G Introductory Plant Science	4
AGRO 365 Principles of Crop Production	4
SOIL 252 Soils	3
SOIL 252 L Soils Laboratory	1
SOIL 312 Soil Management and Fertility	3
SOIL 312 L Soil Management and Fertility Lab	1
Select 3-4 credits from the following to bring the total AGRO and SOIL credits to a minimum of 18 credits:	3-4
AGRO 250 Plant Propagation	
AGRO 305 Principles of Genetics	
AGRO 311 Introduction to Weed Science	
AGRO 315 Crop Physiology	
AGRO 462 Plant Breeding	
AGRO 471 Plant Mineral Nutrition	
AGRO 483 Sustainable Production of Agronomic Crops	
SOIL 456 Irrigation and Drainage	
Total Credits	19-20

## Horticulture - Undergraduate Minor

Students majoring in subjects other than Agronomy, Environmental Sciences, Soil Science and Turfgrass Management may pursue a minor in Horticulture. Courses in chemistry (CHEM 111G General Chemistry I/CHEM 112G General Chemistry II) and biology (BIOL 211G Cellular and Organismal Biology) are prerequisites for several of the courses.

### Required Courses

HORT 100G Introductory Plant Science	4
HORT 250 Plant Propagation	3
SOIL 252 Soils	3
Select 9 credits from the following: <sup>1</sup>	9
HORT 305 Principles of Genetics	
HORT 307 Landscape Design	
HORT 310 Medicinal Herbs	
HORT 365 Principles of Crop Production	
HORT 377 Introduction to Turfgrass Management	
HORT 378 Turfgrass Science	
HORT 391 Internship	
HORT 462 Plant Breeding	
HORT 465 Landscape Construction and Maintenance	
HORT 471 Plant Mineral Nutrition	
HORT 485 Vegetable Crop Management	
HORT 488 Greenhouse Management	
HORT 492 Diagnosing Plant Disorders	
Total Credits	19

<sup>1</sup> or other upper division HORT courses deemed appropriate by student's advisor

## Soil Science - Undergraduate Minor

College of Agriculture and Home Economics constants are not required for those students majoring in other colleges. However, CHEM 111G

General Chemistry I and concurrent enrollment in CHEM 112G General Chemistry II are prerequisites for most SOIL courses.

#### Required Courses

SOIL 252	Soils	3
SOIL 252 L	Soils Laboratory	1
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
SOIL 472	Soil Morphology and Classification	4
Select any SOIL course to bring the total SOIL credit hours to 18.		6
Total Credits		18

## Turfgrass Science and Management - Undergraduate Minor

NMSU Requirements: 18 credits; 9 must be upper division. Grades of C- or better are required in all courses applied to the minor.

#### Required Courses

HORT 100G	Introductory Plant Science	4
HORT 110	Athletic Field and Golf Course Management	1
HORT 378	Turfgrass Science	4
HORT 479	Advanced Turfgrass Science	3
Select 6 or more credits from the following:		6
AGRO 311	Introduction to Weed Science	
EPWS 310	Plant Pathology	
EPWS 314	Plant Physiology	
HORT 377	Introduction to Turfgrass Management	
HORT 391	Internship	
HORT 471	Plant Mineral Nutrition	
HORT 492	Diagnosing Plant Disorders	
SOIL 252	Soils	
SOIL 252 L	Soils Laboratory	
SOIL 312	Soil Management and Fertility	
SOIL 312 L	Soil Management and Fertility Lab	
SOIL 424	Soil Chemistry	
Total Credits		18

## Horticulture - Master of Science

Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University. Qualifications for admission will be reviewed by the departmental graduate faculty. Applications should include a letter of interest. A 3.0 undergraduate grade-point average is needed for admission to study for the MS degree. The department requires the GRE scores and three letters of recommendation, transcripts, as well as the student's letter of interest as an admission requirement. Acceptance requires that a graduate faculty member in the applicant's area of interest accept the student into their program.

## Plant and Environmental Science - Master of Science

Qualifications for admission will be reviewed by the departmental graduate faculty. Applications should include a letter of interest. A 3.0 undergraduate grade-point average is needed for admission to study for the M.S degree. The department requires the GRE scores and three letters of recommendation, transcripts, as well as the student's letter of interest as an admission requirement. Acceptance requires that a graduate faculty member in the applicant's area of interest accept the student into their program.

## Plant and Environmental Science - Doctor of Philosophy

Qualifications for admission will be reviewed by the departmental graduate faculty. Applications should include a letter of interest. A 3.3 undergraduate grade-point average is needed for admission for Ph.D. studies. The department requires the GRE scores and three letters of recommendation, transcripts, as well as the student's letter of interest as an admission requirement. Acceptance requires that a graduate faculty member in the applicant's area of interest accept the student into their program.

A student planning a program leading to a Ph.D. must satisfy one of the following departmental requirements approved by the doctoral committee:

1. A thorough knowledge of a language other than English
2. A reading ability in two foreign languages
3. Reading ability in one foreign language and proficiency with a research tool
4. Reading ability in one foreign language and one semester of supervised teaching experience
5. Proficiency with a research tool and one semester of supervised teaching
6. Two semesters of supervised teaching

A number of graduate assistantships are available each year. Inquiries should be addressed to the department.

## School of Hotel, Restaurant and Tourism Management

### Undergraduate Program Information

The School of Hotel, Restaurant & Tourism Management is committed to the broad land-grant mission of New Mexico State University. The school's mission is to serve the needs of our constituents through innovative teaching, research, service, professional applications and partnerships in a multi-cultural and international environment.

This bachelor degree program prepares students for supervisory and management positions in all areas of the diverse and growing hospitality and tourism industry. The program also provides a foundation for continuing development to advance to more senior management or to pursue entrepreneurial opportunities. In this professional program, faculty, students and industry partners bring together theory and practice to forge hospitality management excellence. The curriculum is designed to educate students as individuals and professionals in a changing society. Students will take a core curriculum until senior year, when they develop an individual plan with a faculty advisor for selecting

professional elective courses. A grade of C- or better must be earned in each upper-division HRTM class to satisfy the requirement of the major.

Students are required to participate in an internship program that is offered only after completion of 400 hours of hospitality work experience (practicum). The HRTM 307 Professional Development, HRTM 408 Hospitality Internship, and HRTM 409 HRTM Internship Seminar internship sequence, which includes another 400 hours in the field, must be completed prior to enrolling in other 400-level professional electives. Thus, at the end of both the work experience practicum and the internship, students will have completed a minimum of 800 hours professional work experience in the field.

## Degree for the Department

Hotel, Restaurant and Tourism Management - Bachelor of Science

Hotel, Restaurant and Tourism Management - Undergraduate Minor

**Director - Jean Hertzman**

**Professors** - Priscilla Bloomquist; Jean Hertzman; Keith Mandabach; Betsy Stringam **Associate Professors** - Gregory Blanch **College Assistant Professors** - Daren Bloomquist; Julie Correa; John Hartley; Peter Mitchell

## Hotel, Restaurant and Tourism Management Courses

### HRTM 111. Freshman Orientation

#### 1 Credit

Orientation to university life, including available resources and methods to promote success at NMSU. Open to all freshmen and transfer students. Graded S/U.

### HRTM 200. Special Topics

#### 1-4 Credits

Specific subjects and credits to be assigned on a semester basis for both lecture and laboratory assignments. May be repeated for a maximum of 4 credits.

**Prerequisite:** consent of instructor.

### HRTM 201. Introduction to Tourism

#### 3 Credits

Survey of travel and tourism development and operating characteristics.

### HRTM 221. Introduction to Hospitality Management

#### 3 Credits

Overview of the major segments of the hospitality industry, with a focus on basic management principles.

### HRTM 231. Safety, Sanitation and Health in the Hospitality Industry

#### 2 Credits

Addresses public health, HACCP, safety and culinary nutrition responsibilities in the hospitality industry. Sanitation certification test allows students to receive national credential.

### HRTM 263. Food Production and Service Fundamentals

#### 3 Credits (1+4P)

Basic overview of food service systems including menu management, purchasing and production. The course includes basic principles of food fabrication and production. Topics include knife skills, culinary terminology, product identification, quality standards, nutritional cooking theory and application of food preparation techniques. The course includes laboratory aspects and demonstration of basic food production techniques, service styles, practices and procedures in food service operations including culinary math. This course provides students with an understanding of food service sanitation and culinary nutrition. Completion of a national certification examination is required. Restricted to Las Cruces campus only.

**Prerequisite(s):** HRTM 221 or FSTE 263G.

### HRTM 301. Hotel, Restaurant, and Tourism Marketing

#### 3 Credits

The development of effective marketing programs for hospitality service organizations. Prerequisites: HRTM 221

### HRTM 302. Hospitality Management Accounting

#### 3 Credits

Specialized accounting for hotel revenue and expenses; accounting for inventory, property, and equipment; hospitality payroll accounting; hotel departmental financial statements; income statement, balance sheet, and statement of cash flows; the analysis of financial statements; interim and annual reports; budgeting expenses; forecasting sales; budgetary reporting and analysis; and financial decision making.

**Prerequisite:** ACCT 221.

### HRTM 304. Hospitality and Travel Law

#### 3 Credits

Specialized applications of the law to the hospitality and tourism industry.

**Prerequisite:** HRTM 221.

### HRTM 307. Professional Development

#### 1 Credit

Covers essential elements of career management including preparation for a successful internship. Restricted to majors. Graded S/U.

### HRTM 311. Hospitality Leadership Management

#### 3 Credits

Examines modern leadership theory in the context of the hospitality industry. Connects contemporary leadership topics to their historical antecedents through focused reading, discussion and film.

**Prerequisites:** HRTM 221 and HRTM 201.

### HRTM 331. Hotel Operations I

#### 3 Credits

Analysis of hotel systems design, process, and applications for operating areas including guest services, reservations, reception, telecommunications, guest/city ledger, and the night audit.

**Prerequisites:** HRTM 201 and HRTM 221.

### HRTM 363. Quantity Food Production and Service

#### 6 Credits (1+10P)

Covers quantity food production including cooking concepts, sanitation and safety, teamwork, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe or NM Food Handler certification required. May be repeated up to 6 credits. Crosslisted with: HNDS 363.

**Prerequisite(s):** HRTM 263.

**HRTM 404. Gaming Operations and Organization****3 Credits**

Introduction to the multi-billion-dollar industry, including an historical overview, social and economic impacts of gaming, and casino operations.

**Prerequisites:** HRTM 201 and HRTM 221.

**HRTM 408. Hospitality Internship****1 Credit**

Hospitality and tourism professional work experience for HRTM majors only. Restricted to majors.

**Prerequisites:** HRTM 307 and consent of instructor.

**HRTM 409. HRTM Internship Seminar****1 Credit**

A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they encountered during HRTM 408 (Internship) and analyze them. Restricted to majors.

**Prerequisites:** HRTM 408.

**HRTM 410. Hospitality Cost Control****3 Credits**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers.) Provides tools needed to communicate effectively about global financial issues affecting the hospitality business.

**Prerequisite:** HRTM 408.

**HRTM 412. Beverage Management****3 Credits**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation.

**Prerequisite:** HRTM 408.

**HRTM 413. Restaurant Operations Management****4 Credits (1+6P)**

Provides a detailed understanding of the processes of restaurant operations management. Students are expected to increase kitchen technical skills, learn to cook from recipes and develop a personal culinary style. Provides the opportunity to perform a detailed analysis of a food and beverage operation, including running and selectively analyzing the reports from systems. Proof of current NM Alcohol Server certification required. May be repeated up to 4 credits.

**Prerequisite(s):** HRTM 363.

**HRTM 414. International Food and Wine****3 Credits**

An experiential examination of wine through lectures, films, guest speakers and focused tasting of food and wine. Topics include viticulture, wine making varietals, terroir, and food pairings. Student must be at least 21 years old.

**Prerequisite:** consent of instructor.

**HRTM 420. Club Management and Marketing****3 Credits**

Provides an understanding of the general operational and administrative procedures practiced in private clubs from a marketing perspective with a special emphasis on managing and marketing club food and beverage operations and service. It will provide the professional golf management and hospitality students with the unique sensitivities required in managing and operating in the increasingly lucrative club management market.

**HRTM 430. Hospitality Facilities Management****3 Credits**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant.

**Prerequisite(s):** HRTM 331, HRTM 408.

**HRTM 431. Hotel Operations II****3 Credits**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems.

**Prerequisite(s):** HRTM 331, HRTM 408.

**HRTM 432. Hotel Revenue and Sales Management****3 Credits**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level.

**Prerequisite:** HRTM 408.

**HRTM 433. Training for Hospitality Operations****3 Credits**

Analysis of training needs and methods in hospitality organizations.

**Prerequisite(s):** MGT 332.

**HRTM 434. Senior Capstone Experience****3 Credits**

Synthesizes all previous work. Students apply multi-disciplinary principles to the analysis of hospitality business cases and tourism problems.

**Prerequisite:** HRTM 408.

**HRTM 435. Resort Management****3 Credits**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities. Crosslisted with: HRTM 535.

**Prerequisite(s):** HRTM 331 or consent of instructor.

**HRTM 443. Meetings, Conventions and Special Events****3 Credits**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** HRTM 408.

**HRTM 450. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**Prerequisite:** consent of instructor.

**HRTM 492. Special Problems****1-4 Credits**

Individual research in a selected subject area of hospitality management. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

**Prerequisite:** consent of instructor.

**HRTM 510. Hospitality Cost Control****3 Credits**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers). Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. Same as HRTM 410 with additional work for graduate credit. Consent of Instructor required.

**HRTM 512. Beverage Management****3 Credits**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. Same as HRTM 412 with additional work for graduate credit. Consent of Instructor required.

**HRTM 530. Facilities Management****3 Credits**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant. Same as HRTM 430 with additional work for graduate credit. Consent of Instructor required.

**HRTM 531. Hotel Operations II****3 Credits**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. Same as HRTM 431 with additional work for graduate credit. Consent of Instructor required.

**HRTM 532. Hotel Revenue and Sales Management****3 Credits**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. Same as HRTM 432 with additional work for graduate credit. Consent of Instructor required.

**HRTM 535. Resort Management****3 Credits**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities. Crosslisted with: HRTM 435.

**Prerequisite(s):** HRTM 331 or consent of instructor.

**HRTM 543. Meetings, Conventions and Special Events****3 Credits**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. Same as HRTM 443 with additional work for graduate credit. Consent of Instructor required.

**HRTM 590. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

**Prerequisite:** consent of instructor.

**HRTM 598. Special Research Programs****1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**Prerequisite:** consent of instructor.

**HRTM 599. Master's Thesis****1-6 Credits (1-6)**

Thesis.

**Prerequisite:** consent of instructor.

**Name:** Dr. Jean Hertzman, Director

**Office Location:** Gerald Thomas Hall 138

**Phone:** (575) 646-5995

**Website:** <http://aces.nmsu.edu/academics/shrtm/>

## Hotel, Restaurant and Tourism Management - Bachelor of Science

### Core Courses

**General Education Requirements**

Select 36 credits of general education requirements and 6 credits of Viewing A Wider World Courses. <sup>1,2</sup>	42
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**Departmental Requirements**

HRTM 201	Introduction to Tourism	3
HRTM 221	Introduction to Hospitality Management	3
HRTM 263	Food Production and Service Fundamentals	3
HRTM 301	Hotel, Restaurant, and Tourism Marketing	3
HRTM 302	Hospitality Management Accounting	3
HRTM 304	Hospitality and Travel Law	3
HRTM 307	Professional Development	1
HRTM 311	Hospitality Leadership Management	3
HRTM 331	Hotel Operations I	3
HRTM 363	Quantity Food Production and Service	6
HRTM 408	Hospitality Internship	1
HRTM 409	HRTM Internship Seminar	1
HRTM 410	Hospitality Cost Control	3
HRTM 430	Hospitality Facilities Management	3
HRTM 434	Senior Capstone Experience <sup>3</sup>	3

**Nondepartmental Requirements**

A ST 251G	Statistics for Business and the Behavioral Sciences <sup>4</sup>	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
ACCT 221	Principles of Accounting I (Financial)	3
Select one from the following:		3-6
ECON 201G	Introduction to Economics	
ECON 251G & ECON 252G	Principles of Macroeconomics and Principles of Microeconomics <sup>5</sup>	
FIN 341	Financial Analysis and Markets	3
MGT 309	Human Behavior in Organizations	3
MGT 332	Human Resources Management	3

SPAN 111	Elementary Spanish I (or any higher level Spanish course)	4
Any MKTG #300 and above		3
<b>Departmental Electives</b>		
Select 9 credits of Professional Departmental Electives in consultation with your advisor.		9
<b>Student may need open elective credits to bring total credits to 120 credits for graduation.</b>		
Total Credits		118-121

- <sup>1</sup> A list of specific general education requirements available in the department. Please check with your advisor.
- <sup>2</sup> Viewing A Wider World Requirement - Two courses in two different colleges, with at least one from outside ACES. See list of approved courses in the catalog. (300+ level courses with a "V" behind them.)
- <sup>3</sup> Complete during final semester.
- <sup>4</sup> Counts as Area II - Math/Algebra requirement
- <sup>5</sup> Counts as Area IV - Social/Behavioral Sciences requirement

## Departmental Electives

Select 9 credits of Departmental Electives. The following are typical offerings: 9

HRTM 412	Beverage Management
HRTM 413	Restaurant Operations Management
HRTM 414	International Food and Wine
HRTM 420	Club Management and Marketing
HRTM 431	Hotel Operations II
HRTM 432	Hotel Revenue and Sales Management
HRTM 443	Meetings, Conventions and Special Events
HRTM 450	Special Topics (If pre-approved)
HRTM 492	Special Problems (If pre-approved)

Total Credits 9

## Hotel, Restaurant and Tourism Management - Undergraduate Minor

A minor in the School of Hotel, Restaurant and Tourism Management consists of 18 or more credit hours of approved course work of which at least 12 must be numbered 300 or higher: all completed with a grade of "C" or higher.

## Requirements

### Required Courses:

HRTM 221	Introduction to Hospitality Management	3
HRTM 302	Hospitality Management Accounting	3

**Choose one additional HRTM course (200-level):** 3

HRTM 201	Introduction to Tourism
HRTM 263	Food Production and Service Fundamentals

**Choose nine credits of 300-level courses:** 9

HRTM 301	Hotel, Restaurant, and Tourism Marketing
HRTM 304	Hospitality and Travel Law

HRTM 311	Hospitality Leadership Management	
HRTM 331	Hotel Operations I	
HRTM 363	Quantity Food Production and Service	
Total Credits		18

Permission to take the Hospitality Internship sequence of classes or HRTM 400 level classes may be granted on an individual basis.

## Water Science and Management Graduate Program Information

New Mexico faces serious challenges concerning the supply, development, quality, management and administration of water resources; responses to the challenges will have major impacts on the regional economy, environmental quality and the quality of life of the residents of New Mexico. A major need exists to train the next generation of water resource researchers, educators, and managers to address these challenges, both inside and outside New Mexico. To help meet these needs, an interdisciplinary program in Water Science & Management (WSM) has been developed at NMSU by the departments of

- Agricultural Economics and Agricultural Business,
- Animal and Range Science,
- Civil Engineering,
- Geography, and
- Plant and Environmental Sciences.

The primary purposes of the interdisciplinary masters and doctoral degree programs in WSM are to provide graduate education for addressing state, national, and international water issues, and to train the next generation of water professionals needed to meet the challenges noted above. A Master of Science WSM degree can be earned with 26 credits of formal course work, plus additional thesis research credits, and a Doctor of Philosophy WSM can be earned with 30-40 credits of formal course work beyond the masters, plus additional dissertation research credits.

Five (5) fields of study are offered in the program and are detailed below (suggested classes for each area are detailed in the following section):

- **Agricultural Water Resources** relates to the major use of ground and surface water in providing safe and secure food systems while ensuring ecosystem services. This field of study includes water allocation, water conservation and water management issues facing urban water supply and irrigated agriculture.
- **Watershed, Riparian and Aquatic Systems** includes the processes of organizing and guiding land and other resources used in a river basin to provide desired goods and services without adversely affecting soil and water resources. Watershed, riparian, and aquatic system management involves an array of nonstructural (vegetation management) practices, as well as an array of structural (engineering) activities, when conditions warrant.
- **Water Quality and Treatment** includes processes used to make water acceptable for desired end-uses. These can include use as drinking water, industrial processes, agricultural uses and environmental management. The goal of water treatment processes is to remove existing contaminants in the water or reduce the concentration of such contaminants so the water becomes fit for its desired end-use.
- **Water Economics and Policy** examines the demand for water by all its competing uses, including irrigated agriculture, energy, urban

supply, and environmental restoration and management. Policies are examined for their influence on water supplies, water demands, and economic values of water reallocations among agricultural, environmental, energy, and urban users. It examines the role of water markets, water user decisions, institutional adjustments, and water-related policies with respect to resource costs, water quality, profitability, and environmental effects.

- **Water Informatics** is an interdisciplinary science primarily concerned with the collection, classification, manipulation, storage, retrieval and especially the dissemination of water information, including both human and machine readable documents. Examples of human readable documents include maps, field data sheets, operational schedules, and long term asset management plans with narrative text. Machine readable documents include files for geographic information systems (GIS), Global Positioning Systems (GPS), relational database management systems and emerging applications.

## Admission Requirements

**Admission Requirements for the Master of Science (MS)** in water science and management include all general requirements for a graduate degree as set forth in the NMSU Catalog, plus the following:

- Possession of a bachelor's degree from an accredited university grade point average of 3.5 or higher on a 4.0 scale. However, students with grade point averages between 3.0 and 3.5 will be given consideration, this degree being preparatory to the Water Science and Management degree.
- A letter of intent or statement of purpose that addresses individual professional and personal goals related to water science and management and discusses how these goals fit within the degree programs at NMSU. It is expected that the candidate will have made contact with prospective advisor(s) at NMSU and speak to how he or she would work with said advisor(s) to advance their research and study.
- Three letters of recommendation submitted directly from persons who know the applicant professionally, including a recommendation from the candidate's current employer/sponsor. These letters should provide evidence of professional ability, research experience and the potential for professional development.
- A brief resume or curriculum vitae not to exceed five pages that summarize the candidate's background and qualifications.

**Admission Requirements for the Doctor of Philosophy (Ph.D.)** in water science and management include all general requirements for a graduate degree as set forth in the NMSU Catalog, plus the following:

- Possession of a master's degree from an accredited university with a grade point average of 3.5 or higher on a 4.0 scale. However, students with grade point averages between 3.0 and 3.5 will be given consideration. This degree being preparatory to the Water Science and Management doctorate.
- Three letters of recommendation submitted directly from persons who know the applicant professionally, including a recommendation from the candidate's current employer/sponsor. These letters should provide evidence of professional ability, research experience, and the potential for professional development.
- In addition, applicants to the Ph.D. program should provide evidence of research experience. This could include a master's thesis, a professional paper, peer reviewed manuscripts, consulting reports, or other evidence of experience conducting research.

- A letter of intent or statement of purpose that addresses individual professional and personal goals related to water science and management and discusses how these goals fit within the degree programs at NMSU. It is expected that the candidate will have made contact with prospective advisor(s) at NMSU and speak to how he or she would work with said advisor(s) to advance their research and study.
- A brief resume or curriculum vitae not to exceed five pages that summarize the candidate's background and qualifications.

## Degree Requirements

### Water Science & Management Graduate Courses

The following courses are courses deemed likely to support each of the five fields of study, but this list is not meant to be all inclusive. Variations from or additions to this list may be made by the candidate, subject to the approval by the thesis or dissertation committee chairperson.

#### Agricultural Water Resources

A EN 459	Design of Water Wells/Pumping Systems	3
A EN 478	Irrigation and Drainage Engineering	3
AGRO 620	Instrumentation in Agronomy	3
C E 452	Geohydrology	3-4
C E 482/E S 452/ GEOL 452	Hydraulic Structures	3
C E 483	Surface Water Hydrology	3
C E 485	Design of Earth Dams	3
C E 506	Advanced Soil Mechanics	3
C E 531	Open Channel Hydraulics	3
C E 557	Water Resources Development	3
C E 581	Ground Water Hydrology	3
C E 582	Statistical Hydrology	3
C E 682	Topics in Hydrodynamics II	3
GEOG 467	Transportation Geography	3
GEOG 552	Landscape Ecology	4
GEOG 553	Geomorphology	3
M E 530	Intermediate Fluid Mechanics	3
M E 533	Computational and Theoretical Fluid Mechanics	3
SOIL 456	Irrigation and Drainage	3
SOIL 477	Environmental Soil Physics	3
SOIL 477 L	Environmental Soil Physics Laboratory	1
SOIL 479	Environmental Soil Chemistry	3
SOIL 652	Advanced Soil Physics	3

#### Watersheds, and Aquatic and Riparian Wetlands

BIOL 533	Environmental Physiology of Plants	3
C E 483	Surface Water Hydrology	3
C E 557	Water Resources Development	3
C E 581	Ground Water Hydrology	3
C E 682	Topics in Hydrodynamics II	3
FWCE 459	Aquatic Ecology	4
FWCE 482	Ichthyology	4
FWCE 532	Environmental Biology of Fishes	4
FWCE 534	Aquatic Contaminants and Toxicology	4
GEOL 452	Geohydrology	4

RGSC 518	Watershed Methods and Management	3
SOIL 456	Irrigation and Drainage	3
SOIL 472	Soil Morphology and Classification	4
SOIL 477	Environmental Soil Physics	3
SOIL 477 L	Environmental Soil Physics Laboratory	1
SOIL 652	Advanced Soil Physics	3

### Water Quality and Treatment

BIOL 477	Applied and Environmental Microbiology	4
ENVE 456	Environmental Engineering Design	3
ENVE 462	Sampling and Analysis of Environmental Contaminants	3
ENVE 551	Unit Processes/Operation of Water Treatment	3
ENVE 552	Unit Processes/Operation of Wastewater Treatment	3
ENVE 552 L	Unit Processes/Operation of Wastewater Treatment Laboratory	1
ENVE 557	Surface Water Quality Modeling	3
ENVE 630	Fate and Transport of Environmental Contaminants	3
FWCE 534	Aquatic Contaminants and Toxicology	4

### Water Economics and Policy

AEEC 575	Economics of Water Resource Management and Policy	3
PHLS 452	Environmental Health	3
ECDV 651	Economic Development Theory	3
ECDV 661	Regional Economic Modeling I	3
ECDV 662	Regional Economic Modeling II	3
ECDV 664	Population Economics	3
ECDV 668	Economic Development Finance	3
ECDV 671	Sustainable Economic Development	3
MPH 550	Environmental Public Health Issues	3
MPH 565	International Health Problems	3
MPH 567	Rural Health Issues	3
MPH 569	U.S.-Mexico Border Health Issues	3

### Water Informatics

GEOG 521	GIS & T Applications and Modeling	3
GEOG 571	Cartography and Geographic Information Systems	4
GEOG 572	Geodatabase Design	3
GEOG 573	Introduction to Remote Sensing	4
GEOG 578	Fundamentals of Geographic Information Science and Technology (GIS & T)	4
GEOG 581	System Design for Geographic Information Science and Technology (GIS & T)	3
GEOG 582	Advanced Remote Sensing	4
GEOG 585	Advanced Spatial Analysis	3

## Degrees for the Department

Water Science and Management - Master of Science (p. 176)

Water Science and Management - Doctor of Philosophy (p. 176)

## Minors for the Department

Both minors within the WSAM program are affiliated with other departments.

Geographic Information Science and Technology (GIS&T) - Graduate Minor (p. 177)

Applied Statistics - Graduate Minor (p. 177)

**Affiliated Faculty** – S. Angadi, Ph.D. (University of Manitoba, Canada); S. Archambault, Ph.D. (UNM); A. Salim Bawazir, Ph.D. (NMSU); M.P. Bleiweiss, M.S. (California State-Los Angeles); W.Boeing, Ph.D. (Louisiana State); K. Boykin, Ph.D. (NMSU); C. E. Brewer, Ph.D. Iowa State); C. Brown, Ph.D. (San Diego State/California-Santa Barbara); S. W. Brown, Ph.D. (NMSU); C. A. Caldwell, Ph.D. (Tennessee); K. C. Carroll, Ph.D. (Arizona); D. E. Cowley, Ph.D. (Wisconsin); D. S. Cram, Ph.D. (NMSU); M. N. DeMers, Ph.D. (Kansas); C. M. Downes, Ph.D. (New Mexico); D. W. DuBois, Ph.D. (Nevada); D. P. Dugas, Ph.D. (Oregon); A. G. Sam Fernald, Ph.D. (Colorado State); A. Ghassemi, Ph.D. (NMSU); R. M. Goss, Ph.D. (Nebraska); W. R. Gould, Ph.D. (North Carolina State); S. J. Guldán, Ph.D. (Minnesota); P. Gutierrez, Ph.D. (J. Herrick, Ph.D. (Ohio State); B. H. Hurd, Ph.D. (California-Davis); M. D. Johnson, Ph.D. (NMSU); N. Khandan, Ph.D. (Drexel University); J. P. King, Ph.D. (Colorado State); A. S. Lara, Ph.D. (NMSU); B. Leinauer, Ph.D. (Hohenheim University, Germany); H. Luo, Ph.D. (Tulane); M. C. Mitchell, Ph.D. (Minnesota); M. O' Neill, Ph.D. (Arizona); L. Papelis, Ph.D. (Stanford); J. T. Peach, Ph.D. (Texas); G. A. Picchioni, Ph.D. (Texas A&M); R. C. Pratt, Ph.D. (Purdue); A. Rango, Ph.D. (Colorado State); D. A. Rockstraw, Ph.D. (Oklahoma); R. Sallenave, Ph.D. (University of Guelph-Canada); Z. A. Samani, Ph.D. (Utah State); M. K. Shukla, Ph.D. (University of Agricultural Sciences-Vienna, Austria); G. Sims, Ph.D. (Purdue); G. B. Smith, Ph.D. (North Carolina State); R. G. Smits, Ph.D. (Purdue); S. N. Smirnov, Ph.D. (Novosibirsk University, Russia); R. St. Hilaire, Ph.D. (Iowa State); C. M. Steele, Ph.D. (King's College, University of London-UK); K. Stevens, M.S. (NMSU); B. L. Stringam, Ph.D. (Utah State); A. L. Ulery, Ph.D. (California-Riverside); J. Urquidi, Ph.D. (Texas Tech); F. A. Ward, Ph.D. (Colorado State); N. Webb, Ph.D. (University of Queensland, Australia); B. Widner, Ph.D. (Colorado State); P. Xu, Ph.D. (Ecole Nationale de Gunie Rural, Des Eaux Et Des Forets, France)

## Water Science and Management Courses

### WSAM 470. Environmental Impacts of Land Use and Contaminant Remediation 3 Credits

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: E S 470.

**WSAM 589. Landscape Hydrology Modeling****3 Credits**

Understand the landscape scale of hydrologic cycle and related hydrological processes. Quantitatively evaluate hydrological system components. Retrieve, visualize and model some of the physical processes using some of the available tools. Consent of Instructor required.

**WSAM 599. Masters Thesis****1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits. Consent of Instructor required. Restricted to: Water and Science Management majors. Thesis/Dissertation Grading.

**WSAM 605. Arid Land Water Resources****3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. May be repeated up to 3 credits. Crosslisted with: E S 605.

**WSAM 610. Water and Sustainable Economic Development****3 Credits**

For graduate students in the Water Science and Management or other research degree programs, use the water economics literature as a model for student research leading to an M.S. thesis or Ph.D. dissertation.

**WSAM 700. Doctoral Dissertation****15 Credits (15)**

Dissertation for Water Sciences and Management Majors May be repeated up to 88 credits. Restricted to: Water Sciences and Management majors. Thesis/Dissertation Grading.

**Name:** Jesslyn Ratliff

**Office Location:** Stucky Hall

**Phone:** (575) 646-1194

**Website:** <http://wsm.research.nmsu.edu>

**Coordinating Institute**

- New Mexico Water Resources Research Institute, (575) 646-4337

**Sponsoring Departments**

- *Agricultural Economics and Agricultural Business*, (575) 646-3215, <http://aeab.nmsu.edu>
- *Animal and Range Sciences*, (575) 646-2514, <http://anrs.nmsu.edu>
- *Civil Engineering*, (575) 646-3801, <http://ce.nmsu.edu>
- *Geography*, (575) 646-3509, <http://geography.nmsu.edu>
- *Plant and Environmental Sciences*, (575) 646-3405, <http://aces.nmsu.edu/academics/pes>

## Water Science and Management - Master of Science

### Core Courses

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of

formal course work, plus six additional thesis research credits, as detailed below.

**Core Courses**

AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
Select one from the following: <sup>1</sup>		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Advanced Spatial Analysis	
Select one from the following: <sup>2</sup>		1-3
Seminar		
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Electives from the designated water list for the relevant field of study		10
Free electives in consultation with the student's committee		5
Thesis		6
<b>Total Credits</b>		<b>31-34</b>

<sup>1</sup> With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Advanced Spatial Analysis may be used as a substitute.

<sup>2</sup> Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

## Water Science and Management - Doctor of Philosophy

### Core Courses

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 30-40 credits of formal course work beyond the Masters Degree, plus additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below.

Master's Degree Requirements		32
Doctoral Degree Requirements		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
C E 557	Water Resources Development	3
GEOG 578 or GEOG 521	Fundamentals of Geographic Information Science and Technology (GIS & T) GIS & T Applications and Modeling	3-4
Select one from the following: <sup>1</sup>		4
A ST 505	Statistical Inference I	

C E 582	Statistical Hydrology	
GEOG 585	Advanced Spatial Analysis	
Select one from the following: <sup>2</sup>		2-3
Seminar		
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Electives from the designated water list for the relevant field of study		10
Free electives in consultation with the student's committee		5
Dissertation		18
Total Credits		83-85

<sup>1</sup> With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Advanced Spatial Analysis may be used as a substitute.

<sup>2</sup> Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science and Technology (GIS & T), or GEOG 521 GIS & T Applications and Modeling, or FWCE 535 Special Topics.

## Applied Statistics - Graduate Minor

Students interested in completing a Geographic Information Science and Technology minor should consult with the Economics, Applied Statistics and International Business department (<http://business.nmsu.edu/academics/graduate-programs/ms-astat-minor/>).

## Geographic Information Systems - Graduate Minor

Student interested in completing a Geographic Information Systems minor should consult with the geography department (<http://geography.nmsu.edu>)

# COLLEGE OF ARTS AND SCIENCES

Dean - *Enrico Pontelli*

Interim Associate Dean (Research) - *James Murphy*

Associate Dean (Academics) - *Beth Pollack*

Associate Director, Research Center - *TBA*

Undergraduate programs offered in the College of Arts and Sciences prepare students for a variety of career opportunities and for graduate study. The broad curriculum offered provides both the motivation and the tools for lifelong learning experiences.

While the ultimate responsibility for planning an academic program in compliance with university, college and departmental requirements rests with the student, the college recognizes the importance of helping students work out appropriate academic programs.

Students should consult the "Academic Regulations (p. 53)" section of the catalog regarding general limitations for total credit hours, independent study and registration under S/U option. Students in the College of Arts and Sciences on Academic Probation 1 are limited to 13 credit hours, and students on Probation 2 are limited to 7 credit hours. The Regulations section of the catalog discusses registration, drop/add and withdrawal deadlines. Students may not do additional course work or repeat course exercises after the semester has ended in order to raise a grade in any course. Exceptions will be made for students completing an official Incomplete grade.

## College Undergraduate Degree Requirements

1. In accordance with NMSU policy, students in all majors in the College of Arts and Sciences must meet the Basic Academic Skills requirements in English and Mathematics. See "Basic Academic Skills (p. 53)" in the General Information, Regulations section.

### Basic Academic Skills rules:

- a. Students must complete, with a C- grade or better, in MATH 111 Fundamentals of Elementary Mathematics I and MATH 112G Fundamentals of Elementary Math II, or any mathematics course numbered 120 or above which includes A ST 251G Statistics for Business and the Behavioral Sciences, STAT 251G Statistics for Business and the Behavioral Sciences and STAT 271G Statistics for Psychological Sciences. Please see department requirements for each major for specific mathematics requirements.
- b. Students must complete, with a C - grade or better, ENGL 111G Rhetoric and Composition, ENGL 111GH Rhetoric and Composition Honors, or ENGL 111 M Rhetoric and Composition for International and Multilingual Students prior to enrolling in upper division courses numbered 300 or higher.  
*NOTE: Transfer students must complete an English course listed above and begin their Math sequence no later than their second semester at NMSU in order to continue enrolling in upper division courses numbered 300 level or higher.*

- c. Students whose ACT or other test scores require them to take developmental Mathematics or English courses must complete those courses prior to enrolling in the English and Mathematics basic skills courses listed above.

2. University graduation requirements. See "Graduation Requirements (p. 53)" in the "General Information" section in this catalog. In order to graduate, students must have met all degree requirements for their major, earned a minimum of 120 university level credits, or more if required for the degree, of which at least 48 must be upper division and must have a cumulative GPA of 2.0 in all courses taken at NMSU. Each student must complete at least 30 of the necessary credits for their Bachelor Degree at NMSU. A minimum of "C-" in all courses counting toward the major, supplemental major and minor is required of all students.

## S/U Grading Option for Undergraduate Students

Instructors may establish individual standards for an S grade, but the minimum standard for an S grade in the College of Arts and Sciences courses is a C-.

## Developmental and Applied Credit Limitations for Undergraduate Students

The College of Arts and Sciences will accept all applied coursework, which include Occupational Education courses, BOT, CMT, UNIV (not including UNIV 150 The Freshman Year Experience and UNIV 350 Peer Education), ART (applied), DANC (applied), MUS (applied and participation), THTR (applied), NURS, A EN, AXED, AG E, AGHE, COLL, CCDL, CCDS, all lower-division RDG. These courses count towards overall credit hours to bring the students total to the minimum credit hours required. Students must still complete all university requirements: GEN ED; VWW; a minimum of 48 upper division credits as well as all requirements for their declared major degree.

Credits earned in developmental courses (N suffix) are not counted toward any arts and sciences degree. Students should contact the Student Records Center regarding the acceptability of specific courses.

## Independent Study/Directed Reading Courses for Undergraduate Students

Students are limited to six credits in any independent study course. Independent study courses include directed reading and special topic courses, which do not carry a subtitle.

## Distance Education Courses

The College of Arts and Sciences offers a variety of distance education/online courses each semester. Specific courses can be found under departmental course listings online. Students who successfully complete NMSU distance education courses receive the same credit as students who take an equivalent course on the Las Cruces campus. Distance education courses appear on a student's transcript in the same way a course taken on the Las Cruces campus does. Students will be charged a Course Delivery Fee for taking online courses.

## Majors, Minors and Supplementary Majors for Undergraduate Students

Students who wish to obtain a bachelor's degree must select a major field or fields. For a listing of majors, the student should refer to the list of majors in this catalog. Course requirements for majors are listed under individual departments. Students should consult the department for current admissions requirements. Until a major is selected, the student is designated as undeclared.

Each major consists of not less than 20 credits of upper-division courses (300 and above) in a specific field. Students must earn a grade of C- or better for all course requirements indicated for each major, minor, or

supplementary major, including any courses required from outside the department. Students may not count an S grade towards completion of any major, minor or supplementary major requirement unless a course is automatically S/U for all enrolled students. A student may not earn a minor that bears the same name as a bachelor's degree that the student is earning. (For example, a student earning a B.S. in Biology cannot also earn a minor in Biology.) Some departments also require specific courses outside the major field. Please refer to the departmental section of the catalog for specific nondepartmental requirements. These nondepartmental requirements must be passed with a grade of C- or better. It is imperative that students consult the departmental sections of this catalog and the department(s) for advice in planning to fulfill requirements for their declared majors.

The requirements for academic minors in the College of Arts and Sciences are found under each offering department or program section of this catalog. Requirements for supplementary majors are found as follows:

- the Supplementary Majors in Chicano Studies, Latin American Studies, and Linguistics (p. 349) are listed under Languages and Linguistics (p. 349);
- the Supplementary Major in Law and Society (p. 316) is listed under Government (p. 316); and
- the Supplementary Major in Applied Mathematics (p. 363) is listed under Mathematical Sciences (p. 363).

Most students have considerable latitude in choosing elective courses. These are the courses beyond university and major requirements that a student must take to bring her or his total credits to the minimum overall credits required for the degree 120 or 128. This latitude provides students with opportunities to major in more than one field, to take a minor or to devise interdisciplinary programs tailored to individual interests or future career needs.

Regardless of the option elected, students should consult regularly with an advisor and track their progress towards degree completion and graduation using the online degree audit system STAR (Student Academic Requirements), at: <http://www.my.nmsu.edu>.

## Supplementary Majors

- Applied Mathematics in the Department of Mathematical Sciences (p. 363)
- Chicano Studies in the Department of Languages & Linguistics (p. 349)
- Latin American Studies in the Department of Languages & Linguistics (p. 349)
- Law and Society in the Department of Government (p. 316)
- Linguistics in the Department of Language & Linguistics (p. 349)
- Sustainable Development in the Department of Anthropology (p. 182)

## Preprofessional Studies

- Prehealth Studies in the Department of Biology (p. 214)
- Prelaw Studies in the Department of Government (p. 316)

## Bachelors Degrees

Bachelor of Applied Studies (p. 341)

### Bachelor of Arts

### Majors in:

- Anthropology (p. 190)
- Art (p. 205)
- Biology (p. 223)
- Chemistry (p. 238)
- Communication Studies (p. 244)
- Computer Science (p. 255)
- Economics (p. 282)
- Engineering Physics (p. 405) (through the College of Engineering)
- English (p. 293)
- Foreign Languages (p. 358)
- Gender & Sexuality Studies (p. 342)
- Government (p. 322)
- History (p. 335)
- Journalism and Media Studies (p. 347)
- Philosophy (p. 398)
- Physics (p. 405)
- Psychology (p. 414)
- Sociology (p. 422)
- Theatre Arts (p. 426)

Bachelor of Individualized Studies (p. 343)

### Bachelor of Science

#### Majors in:

- Biochemistry (p. 237)
- Biology (p. 224)
- Chemistry (p. 238)
- Computer Science (p. 257)
- Geography (p. 307)
- Geology (p. 313)
- Mathematics (p. 371)
- Microbiology (p. 228)
- Physics (p. 407)

## Designated Bachelor's Degree

Bachelor in Conservation Ecology (p. 225)

### Bachelor of Creative Media

#### Majors in:

- Animation and Visual Effects (p. 269)
- Digital Film Making (p. 270)

Bachelor of Criminal Justice (p. 276)

Bachelor of Fine Arts (p. 206)

Bachelor of Science in Genetics (p. 226)

Bachelor of Music (p. 391)

Bachelor of Music Education (p. 393)

## Dual Degrees

Bachelor of Science/Master of Science in Computer Science (p. 259)

## Masters Degrees

Master of Applied Geography (p. 309)

### Master of Arts

- Anthropology (p. 194)
- Art (p. 208)
- Communication Studies (p. 245)
- English (p. 299)
- Government (p. 325)
- History (p. 336)
- Psychology (p. 415)
- Sociology (p. 422)
- Spanish (p. 362)

### Master of Criminal Justice

Master of Fine Arts (p. 208)

### Master of Fine Arts in Creative Writing

Master of Music (p. 395)

### Master of Public Administration

### Master of Science

- Astronomy (p. 214)
- Bioinformatics (p. 261)
- Biology (p. 230)
- Chemistry (p. 240)
- Computer Science (p. 262)
- Geology (p. 316)
- Mathematics (p. 375)
- Molecular Biology (p. 381)
- Physics (p. 409)

## Dual Degrees

Master of Public Administration/Master of Arts in Public History (p. 326)

Master of Public Administration/Master of Criminal Justice (p. 326)

## Graduate Certificates

Cultural Resource Management (p. 195)

Museum Studies (p. 195)

## Doctoral Degrees

### Doctor of Philosophy

- Astronomy (p. 214)
- Biology (p. 231)
- Chemistry (p. 240)
- Computer Science (p. 263)
- Mathematics (p. 375)

- Molecular Biology (p. 381)
- Physics (p. 409)
- Psychology (p. 416)
- Rhetoric and Professional Communication (p. 301)

## Undergraduate Minors

- Aerospace Studies (p. 182)
- Algorithm Theory (p. 260)
- American Government and Politics (p. 323)
- Animation and Visual Effects (p. 271)
- Anthropology (p. 192)
- Art (p. 207)
- Art History (p. 207)
- Astronomy (p. 212)
- Biochemistry (p. 239)
- Bioinformatics (p. 261)
- Biology (p. 229)
- Chemistry (p. 239)
- Child Advocacy Studies (p. 277) (through the FCS department, in the College of ACES)
- Communication and National Security (p. 245)
- Communication Studies (p. 245)
- Comparative Politics (p. 323)
- Computer Systems (p. 261)
- Conservation Ecology (p. 229)
- Creative Writing (p. 296)
- Digital Film Making (p. 271)
- Economics (p. 282)
- English (p. 297)
- Environmental Chemistry (p. 239)
- Ethics (p. 398)
- Forensic Science (p. 278)
- French (p. 359)
- Gender & Sexuality Studies (p. 343)
- Genetics and Biotechnology (p. 230)
- Geographic Information Science and Technology (p. 309)
- Geography (p. 309)
- Geology (p. 316)
- German (p. 359)
- Government (p. 324)
- History (p. 336)
- Human Biology (p. 230)
- International Relations (p. 324)
- International Studies (p. 344)
- Journalism and Media Studies (p. 349)
- Linguistics (p. 359)
- Literature (p. 297)
- Mathematics (p. 374)
- Medieval and Early Modern Studies (p. 298)
- Microbiology (p. 230)
- Military Science (p. 379)
- Molecular Biology (p. 380)

- Museum Conservation (p. 207)
- Music (p. 395)
- Native American Studies (p. 192)
- Philosophy (p. 398)
- Physics (p. 408)
- Political Theory (p. 324)
- Psychology (p. 415)
- Public Administration (p. 324)
- Public Law (p. 325)
- Religious Studies (p. 193)
- Rhetoric and Professional Communication (p. 299)
- Sociology (p. 422)
- Software Development (p. 261)
- Spanish (p. 360)
- Sustainable Development (p. 193)
- Theatre Arts (p. 427)

## Graduate Minors

- Archaeology (p. 196)
- Bioinformatics (p. 382)
- Communication and National Security (p. 246)
- Communication Studies (p. 246)
- Computer Science (p. 264)
- Food Studies (p. 196)
- Gender & Sexuality Studies (p. 345)
- Geographic Information Science and Technology (p. 310)
- History (p. 337)
- Molecular Biology (p. 382)
- Native American Studies (p. 197)
- Psychology (p. 417)
- Security Studies (p. 326)
- In the College of Arts and Sciences, the Department of Chemistry and Biochemistry is accredited by the American Chemical Society.
- The Bachelor of Science in Computer Science is accredited by ABET.
- Music curricula in the Department of Music are accredited by the National Association of Schools of Music.
- The Master of Public Administration program in the Department of Government is accredited by the National Association of Schools of Public Affairs and Administration.

## Aerospace Studies

### Undergraduate Program Information

Air Force Reserve Officer Training Corps (AFROTC) is a nationwide program that allows students to pursue commissions (become officers) in the United States Air Force (USAF) while simultaneously attending college. AFROTC classes are held on college campuses throughout the United States and Puerto Rico; students can register through normal course registration processes. AFROTC consists of four years of Aerospace Studies classes (Foundations of the USAF, Evolution of USAF and Space Power, Air Force Leadership Studies, and National Security Affairs/Preparation for Active Duty), and a corresponding Leadership Laboratory for each year (where students apply leadership, demonstrate command and effective communication, develop physical fitness, and

practice military customs and courtesies). College students enrolled in the AFROTC program (known as "cadets") who successfully complete both AFROTC training and college degree requirements will graduate and simultaneously commission as Second Lieutenants in the Active Duty Air Force.

### Freshman and Sophomore Years (General Military Course or GMC)

This group provides a general background knowledge of the military establishment with emphasis on the Air Force. GMC courses may be taken out of sequence.

AERO 121 & AERO 122	The Air Force Today I and The Air Force Today II	4
AERO 221	The Air Force Way I	2
AERO 222	The Air Force Way II	2
AERO 223	Air Force Leadership Development	1
Total Credits		9

### Junior and Senior Years (Professional Officer Course or POC)

This group constitutes an in-depth study of topics that provides a broad preparation for a career as an Air Force officer. Students must have certain qualifications for entry and have a desire to be commissioned in the Air Force. These qualifications include, achieving a passing score on the Air Force Officer's Qualifying Test, passing a physical fitness test, and successfully completing a medical exam. They must also complete a four- or five-week summer orientation course.

Students may, with departmental approval, take POC courses out of normal sequence. However, compressed or dual enrollment in upper-division POC courses is normally prohibited. Through this department, you can also earn a minor in Aerospace Studies.

AERO 301	Air Force Leadership and Management I	4
AERO 302	Air Force Leadership and Management II	4
AERO 401	Preparation for Active Duty I	4
AERO 402	Preparation for Active Duty II	4
Total Credits		16

## Leadership Laboratory

This is an integral and mandatory portion of the Aerospace Studies curriculum. Within the framework of the cadet wing, it provides a progression of experiences designed to develop each student's leadership potential and serves as an orientation to military life.

## Minors for the Department

Aerospace Studies - Undergraduate Minor (p. 182)

**Lieutenant Colonel Wendy Woodard, Department Head**

**Assistant Professors and Staff:** Capt Evin Greensfelder, Capt Rebecca Johnson, TSgt Melissa Cadman, SSgt Jeffrey Mayo, and Patti Alarcon

## Aerospace Studies Courses

### AERO 121. The Air Force Today I

#### 2 Credits (1.25+2P)

Survey course on the USAF and AFROTC. Includes mission and organization of the Air Force, officer ship and professionalism, military customs and courtesies, as well as basic communication skills. Leadership Lab practicum, AERO 000 is included.

### AERO 122. The Air Force Today II

#### 2 Credits (1.25+2P)

Continuation of AERO 121, with emphasis on Air Force officer opportunities, group leadership problems, and further development of communication skills (oral and written). Includes Leadership Lab practicum, AERO 000.

### AERO 221. The Air Force Way I

#### 2 Credits (1.25+2P)

Topics include: Air Force heritage, Air Force leaders, an introduction to ethics and values, and an application of communication skills. Facilitates the transition from Air Force ROTC cadet to Air Force ROTC candidate. Includes Leadership Lab practicum, AERO CIOD.

### AERO 222. The Air Force Way II

#### 2 Credits (1.25+2P)

Continuation of AERO 221, including an introduction to leadership, quality Air Force, and continued application of communication skills. Includes Leadership Lab practicum, AERO 000.

### AERO 223. Air Force Leadership Development

#### 1 Credit

This course prepares cadets to excel in field training. Cadets are prepared in all facets of field training, including: leadership competency evaluations, the Cadet's Guide to Field Training, individual drill evaluations, attention to detail, dining hall procedures, maintenance of living areas, and the group problem solving process. Restricted to: Main campus only.

### AERO 301. Air Force Leadership and Management I

#### 4 Credits (3+2P)

Study of the leadership and quality management fundamentals, professional knowledge, Air Force doctrine, leadership ethics, and communication skills required of an Air Force junior officer. Includes Leadership Lab practicum, AERO 000.

**Prerequisites:** Completion of AERO 121/122 and 221/222, or permission of instructor.

### AERO 302. Air Force Leadership and Management II

#### 4 Credits (3+2P)

Continuation of AERO 301, with case studies used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts studied. Continued emphasis on developing communication skills. Includes Leadership Lab practicum, AERO 000. May be repeated up to 4 credits.

**Prerequisite(s):** Completion of AERO 121/122 and 221/222, or permission of instructor.

### AERO 401. Preparation for Active Duty I

#### 4 Credits (3+2P)

Examines the national security process, regional studies, and Air Force doctrine. Special topics focus on the military as a profession, officership, and civilian control of the military. Communication skills (oral and written) are refined. Includes Leadership Lab practicum, AERO 000.

**Prerequisites:** Completion of AERO 121/122, and AERO 221/222 or permission of instructor.

### AERO 402. Preparation for Active Duty II

#### 4 Credits (3+2P)

Continuation of AERO 401, concentrating on advanced leadership ethics, military justice, preparation for active duty, and current issues affecting military professionalism. Continued emphasis on communication skills necessary to succeed as a junior Air Force officer. Includes Leadership Lab practicum, AERO 000. May be repeated up to 4 credits.

**Prerequisite(s):** Completion of AERO 121/122,221/222,301/302, and 401 or permission of instructor.

### AERO 411. Aerospace Studies Independent Study

#### 1 Credit

This course provides in-depth research on specified topics of the United States Air Force and NMSU's Detachment 505 history. Consent of instructor required.

**Prerequisite(s):** AERO 301, AERO 302, AERO 401, AERO 402.

**Phone:** (575) 646-2136

**Website:** <http://airforcerotc.nmsu.edu>

## Aerospace Studies - Undergraduate Minor

### Required Courses

AERO 301	Air Force Leadership and Management I	4
AERO 302	Air Force Leadership and Management II	4
AERO 401	Preparation for Active Duty I	4
AERO 402	Preparation for Active Duty II	4
Select two from the following:		6
HIST 312V	Modern Latin America	
GOVT 360	International Relations	
GOVT 371	Latin American Politics	
GOVT 474	European Politics	
MGT 315V	Human Relations in Organizations	
MGT 333	Training and Development	
MGT 347	Management Functions and Processes	
MGT 388V	Leadership and Society	
MGT 453	Leadership and Motivation	
M SC 310	Leading Small Organizations I	
M SC 320	Leading Small Organizations II	
M SC 401	Leadership Challenges and Goal Setting	
Total Credits		22

## Anthropology

### Undergraduate Program Information

Anthropology is the study of humankind, a multidisciplinary endeavor involving the social sciences, the humanities, and the natural sciences. Anthropologists study the human species and the human condition in all its diversity. Anthropologists ask questions such as: "Who are we?" "Where did we come from?" "How did we get here?" "Why are we different from each other?" and, "How can we better understand each other?"

Studies in anthropology might focus, for example, on our distant ancestors from the African plains, modern workers in a high-tech factory, historic military forts in the Mesilla Valley, Native American Languages,

or prehistoric or contemporary cultures of the American Southwest and Mesoamerica.

Undergraduate education at New Mexico State University covers all four sub-disciplines of the field:

**Biological Anthropology** - the study of human origins, primate relatives, and human biological diversity

**Archaeology** - the study of the origin and change of the human past in both historic and prehistoric times, using material remains

**Cultural Anthropology** - the study of beliefs, values, shared understandings, traditions and modern practices of peoples from around the world

**Linguistic Anthropology** - the study of human language, linguistic diversity, and speech

## Graduate Program Information

The Anthropology M.A. program is designed for students who are interested in the traditional sub-disciplines of anthropology, as well as such related fields as cultural resource management, food studies, medical anthropology, museum studies, and social impact assessment. The program is directed both toward students who intend to take a terminal M.A. degree and students who intend, after NMSU, to enter a Ph.D. program. In addition to the M.A. in anthropology, our program also offers graduate minors in anthropology, archaeology, food studies, and Native American studies, as well as graduate certificates in cultural resource management and museum studies.

An undergraduate anthropology degree is not required for entry into the M.A. program. Students who lack the equivalent of ANTH 301, ANTH 315, and ANTH 355 may be required to take these courses. ANTH 350 or the equivalent is recommended.

## Degrees for the Department

Anthropology - Bachelor of Arts (p. 190)

Anthropology - Master of Arts (p. 194)

Cultural Resource Management - Graduate Certificate (p. 195)

Museum Studies - Graduate Certificate (p. 195)

## Minors for the Department

Anthropology - Undergraduate Minor (p. 192)

Religious Studies - Undergraduate Minor (p. 193)

Sustainable Development - Undergraduate Minor (p. 193)

Native American Studies - Undergraduate Minor (p. 192)

Native American Studies - Graduate Minor (p. 197)

Archaeology - Graduate Minor (p. 196)

Food Studies - Graduate Minor (p. 196)

**Professor, Rani T. Alexander, Department Head**

**Professors** Alexander, Chaiken, Rushforth, Stanford, Walker; **Associate Professors** Arakawa, Scott; **Assistant Professors** Jenks, Ford (Visiting); **College Professors** Conelly, Pepion; **Emeritus Professors** Benefit,

Eber, McCrossin, O'Leary, Staski, Trevathan **Affiliated Faculty** Berryman, Marinas-Feliner; Robles, Steele.

*R. T. Alexander, Department Head, Ph.D. (New Mexico)– Mesoamerican archaeology, historical archaeology of Yucatan, ethnohistory and colonialism, agrarian ecology, fauna analysis; F. Arakawa, Ph.D. (Washington State)– Southwest archaeology, ceramic analysis; M. Chaiken, Ph.D. (California - Santa Barbara)- Participatory development, resettlement, and rural health and nutrition, gender, applied anthropology, Africa and Southeast Asia; W. T. Conelly, Ph.D (California - Santa Barbara)– Agricultural systems, ecological anthropology, applied/development anthropology, Southeast Asia, East Africa, rural communities in the US; B. Ford, PhD (Texas A and M) - hominin dispersals/migrations, human variation, skeletal biology, modern human origins and the peopling of Central Asia; D. Pepion, Ed.D. (Montana State)– Native American studies, ethnohistory, anthropology and education; S. Rushforth, Ph.D. (Arizona)– cultural anthropology, anthropological linguistics, Native American ethnology; M. A. T. Scott, Ph.D. (Kentucky)– medical anthropology, Latin America; L. Stanford, Ph.D. (Florida)– agriculture, organizations, food studies, globalization, sociocultural anthropology, Latin America; A.M. Strankman, MA (U Washington)- museum studies, Native American art; W. Walker, Ph.D. (Arizona)– Southwestern archaeology, theory and field method in archaeology, ritual prehistory.*

**Emeritus Faculty:** *B. R. Benefit, Ph.D. (NYU)– biological anthropology, African paleoanthropology, dental anthropology, paleoecology; C.E. Eber, Ph.D. (emerita; SUNY- Buffalo)– art, drugs, gender, religion, Mesoamerica, women's studies and writing about culture; M. McCrossin, Ph.D. (emerita, California-Berkeley)– biological anthropology, human evolution, African paleoanthropology, primatology; B. O'Leary, Ph.D. (emerita, New Mexico)- Southwest archaeology, cultural resource management, arctic ethnography; E. Staski, Ph.D. (emeritus, Arizona)–historical archaeology, urban anthropology, ethnic relations; W. Trevathan, Ph.D. (Regent's Professor Emerita, Colorado-Boulder)– reproduction, evolutionary medicine, medical anthropology, nutritional anthropology*

## Anthropology Courses

**ANTH 115. Native Peoples of North America**

**3 Credits**

Provides an introduction to the geography, environment, prehistoric cultural origins, sociopolitical organization, language, economics, material culture and technology, religious beliefs and practices, and historic period culture change of Native peoples of North America.

**ANTH 116. Native Peoples of the American Southwest**

**3 Credits**

Introduction to the early history and culture of native people of the Southwest.

**ANTH 118. Introduction to Historic Preservation**

**3 Credits**

Introduction to historic preservation, its history, goals, methods, legal basis, and economic importance. Explores public role in decision-making. Community Colleges only.

**ANTH 120G. Human Ancestors**

**3 Credits**

Evolutionary history of the human species from its origin in the primate order, with primary emphasis on the evolution of humankind during the past three million years. Examination of the social lives of apes and consideration of similarities to and differences from them. Biological foundations of human behavior, emphasizing thought, movement, and interaction.

**ANTH 125G. Introduction to World Cultures****3 Credits**

Examine cross-cultural diversity and human universals through the lens of anthropological inquiry. Explore human thought and behavior in contemporary world cultures covering kinship, economic patterns, power structures, and religious practices and beliefs. The impact of cultural influence on everyday life is emphasized.

**ANTH 130G. Human's Place in Nature: Introduction to Biological Anthropology****3 Credits**

This course uses scientific methods and principles to examine human evolutionary history and family tree relationships, as well as the biological foundations of human behavior. Through lectures, readings and laboratory assignments students are introduced to the history and development of modern evolutionary biology, molecular and population genetics, the primate and human fossil record and modern human biological diversity. By examining the social lives of apes and other primates, primitive and unique aspects of human behavior are identified and the lives of fossil ancestors are reconstructed.

**Corequisite(s):** ANTH 130GL.

**ANTH 130GL. Human's Place in Nature Laboratory****1 Credit**

This one credit laboratory course uses scientific methods and principles to examine evidence for human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity.

**ANTH 201G. Introduction to Anthropology****3 Credits**

Exploration of human origins and the development of cultural diversity. Topics include biological and cultural evolution, the structure and functions of social institutions, belief systems, language and culture, human-environmental relationships, methods of prehistoric and contemporary cultural analysis, and theories of culture.

**ANTH 202G. World Archaeology****3 Credits**

This course is an exploration of human evolution and cultural development throughout the world. Students will be introduced to basic anthropological methods and theories and will learn how anthropological research has contributed to our understanding of major themes in human prehistory, including human evolution, the origins of culture, migration and colonization, animal and plant domestication, and the rise and fall of civilizations.

**ANTH 203G. Introduction to Language and Cultural Anthropology****3 Credits**

Provides an introduction to the methods, theories, and results of two subfields of anthropology: linguistics and cultural anthropology. Linguistics is the study of human language. Cultural anthropology is the study of the organizing principles of human beliefs and practices.

**ANTH 297. Elementary Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**ANTH 301. Cultural Anthropology****3 Credits**

Human concepts of culture and life processes.

**ANTH 305V. Contemporary Native Americans****3 Credits**

Introduction to contemporary native peoples and cultures of North America. Emphasis on sociocultural and socioeconomic history, sociocultural change and persistence, present day reservation life, and current social and economic goals.

**ANTH 306V. Peoples of Latin America****3 Credits**

Introduction to cultural patterns and diversity of Latin America with emphasis on indigenous groups, peasants, plantation workers, and urban residents throughout South America, the Caribbean, Mexico, and Central America.

**ANTH 307. Anthropology of Mexico and Guatemala****3 Credits**

This course focuses on ethnographic study of people in Mexico and Guatemala. Through reading and discussing a variety of ethnographic works, the course will examine some historical and contemporary issues facing different groups of people in this region and will include topics such as gender, indigenous movements, migration, urbanization, and tourism.

**ANTH 312. The Ancient Maya****3 Credits**

Archaeological evidence of culture change in the Maya civilizations of Mexico and Central America from 2000 BC to the Spanish Conquest.

**ANTH 313. Ancient Mexico****3 Credits**

Archaeological evidence of culture change among the Aztecs, Zapotecs, and their predecessors in Central Mexico and Oaxaca from 7,000 BC to the Spanish Conquest.

**ANTH 315. Introduction to Archaeology****3 Credits**

Concepts and methods for study of prehistoric cultures; history of archaeological research.

**ANTH 316. Archaeology of the American Southwest****3 Credits**

Introduction to the prehistoric peoples of the North American Southwest, a historical approach emphasizing the rise of method and theory in the region.

**ANTH 318. Historical Archaeology in Latin America****3 Credits**

Examination of theoretical and methodological issues in historical archaeology in Latin America from 1450 to present, including conquest, colonialism, capitalism, and modernity as anthropological processes. The contributions and limitations of historical, ethnohistorical, and archaeological evidence are emphasized.

**ANTH 320. Anthropological Linguistics****3 Credits**

The study of language and culture with particular emphasis on the cultural factors in the communication process.

**ANTH 330V. Magic, Witchcraft and Religion****3 Credits**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. Crosslisted with: HIST 330V and SOC 330V.

**ANTH 345. Introduction to Museology****3 Credits**

Museum philosophy, history, administration, and collection management. Emphasis on cataloging, care, and exhibition, as well as ethics and public responsibility.

**ANTH 348. Museums & Society****3 Credits**

Examines theoretical frameworks that shape museum administration, exhibits and collections development. Examines themes of gender, space, place, multiculturalism, national and international politics in museum contexts.

**ANTH 350. Anthropological Theory****3 Credits**

This course introduces students to historical and contemporary theory in anthropology with a focus on understanding why theory matters in our discipline. Key questions the course explores include: How have anthropologists thought about the concept of culture in different ways throughout the history of anthropology? What is the relevance of anthropological theory, both inside and outside the discipline? What new and promising trajectories do we see in anthropological theory today?

**ANTH 355. Physical Anthropology****3 Credits**

An introduction to primate behavior, human evolution, and physical variation in modern human populations.

**ANTH 357V. Medical Anthropology****3 Credits**

This course introduces students to evolutionary, ecological, interpretive, political-economic, and applied anthropological perspectives on health, illness, and healing to address some of the major questions in the field. How do humans adapt to changing environments that bring with them new illnesses and diseases? How do anthropologists understand the multiple meanings of health and illness cross-culturally? How can anthropologists effectively study health inequalities? What can medical anthropological perspectives contribute to addressing the health issues that we face in our current global context?

**ANTH 360V. Food and Culture Around the World****3 Credits**

Study of the interaction between food and human culture from an anthropological perspective. Examines the traditional role of food in local economies, social relations, and identity around the world. Also examines the impact of globalization on traditional food systems and cultures.

**ANTH 362. Environmental Anthropology****3 Credits**

This course examines ecology and current environmental studies from an anthropological point of view. The class focuses on how cultural values mediate environmental management. The class will cover topics such as theoretical foundations of ecological anthropology, large scale development, biodiversity conservation, sustainable environmental management, indigenous groups, consumption and globalization.

**ANTH 376. Lithic Technology Organization****3 Credits**

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data.

**Prerequisite(s):** ANTH 315.

**ANTH 378. Introduction to Lab Methods in Archaeology****3 Credits**

Laboratory techniques used in the analysis of archaeological materials.

**ANTH 385. Internship in Anthropology****3-12 Credits (3-12)**

Applied or field experience to gain professional expertise. Placements with public agencies, NGOs, or research organizations. Topical focus tailored to student's individual needs through consultation with instructor.

**Prerequisite(s):** Junior status, consent of instructor and GPA 2.8 or better.

**ANTH 386. Anthropological Study Odyssey****3-6 Credits (3-6)**

This course allows students to explore an anthropological topic, such as an archaeological tradition or culture, through classroom and field activities. Students are initially exposed to a topic during several days of intensive in class work and then pursue greater understanding of the topic through a field trip and possibly limited fieldwork. Readings, site tours, on-site lectures by specialists, and field exercises provide students an opportunity to develop an understanding of anthropological perspectives on the topic as well as to provide exposure to anthropological field and analytic methods. This course also allows students to experience other cultures, prehistoric sites, and/or locales firsthand. May be repeated for credit under a different odyssey title. Taught with ANTH 521. May be repeated up to 6 credits. Consent of Instructor required.

**ANTH 388. Intermediate Archaeological Field School****2-6 Credits (2-6)**

Training in archaeological field methods, including excavations of prehistoric sites, record keeping, mapping and analysis of data. Consent of Instructor required.

**ANTH 389. Archaeological Mapping****3-6 Credits (3-6)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software.

**ANTH 399. Professionalism & Practice in Anthropology****3 Credits**

Capstone course for seniors designed to allow students to synthesize the anthropological knowledge they have acquired and connect theory to application in preparation for entry into a career. Restricted to: ANTH majors.

**ANTH 402. Contemporary Medical Anthropology****3 Credits**

This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health inequalities, and the political economy of infectious disease. Taught with ANTH 546. May be repeated up to 3 credits.

**Prerequisite(s):** ANTH 301 or ANTH 357V or consent of instructor.

**ANTH 404. Cultures of Africa****3 Credits**

Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental challenges such as deforestation are discussed. Taught with ANTH 504. Crosslisted with: HIST 404

**ANTH 415. Applied Anthropology****3 Credits**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 515.

**ANTH 419. Topics in Prehistoric Archaeology****3 Credits**

Specific subjects in prehistoric archaeology as announced in the Schedule of Classes. May be repeated up to 6 credits.

**ANTH 431. Nutritional Anthropology****3 Credits**

Evolutionary and cross-cultural perspective on human nutrition.

**ANTH 433. Women, Gender, and Culture****3 Credits**

Survey of the history of ideas about women and gender in the discipline of anthropology and a comparison of gender roles, relations, and ideologies across a range of cultures. Same as W S 433.

**ANTH 434. Human Evolution****3 Credits**

Overview of human biological evolution from the emergence of Miocene apes to modern human diaspora. May be repeated up to 3 credits. Crosslisted with: BIOL 434.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**ANTH 434 L. Human Evolution Laboratory****1 Credit**

Laboratory in human evolution, includes exercises and activities to learn the human fossil record. Crosslisted with: BIOL 434 L.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** ANTH 434.

**ANTH 449. Directed Reading****1-6 Credits**

Comprehensive reading on selected topics. May be repeated for a maximum of 6 credits.

**Prerequisite(s):** Upper division anthropology majors with consent of instructor.

**ANTH 449 H. Directed Reading Honors****1-3 Credits**

Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.

**ANTH 455. Federal Indian Policy****3 Credits**

Federal Indian policy and its impact on Native Americans. This course will provide basic understanding of how federal Indian policy impacts almost all activities and situations with Native Americans. Course will also look at issues such as sovereignty and how it impacts most interactions with tribal groups.

**ANTH 456. Native American Intersections in Museums****3 Credits**

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 556.

**ANTH 458. Sex, Reproduction and Birth****3 Credits**

This course examines pregnancy and birth practices cross-culturally, including such topics as gendered roles and responsibilities, pregnancy and birth as rites of passage, cultural concepts of personhood, global family planning initiatives, the medicalization of pregnancy and birth, and developing reproductive technologies. May be repeated up to 3 credits.

**Prerequisite(s):** ANTH 301 or ANTH 357V or consent of instructor.

**ANTH 459. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Crosslisted with: HIST 459

**ANTH 467. Archaeology of the American Southwest****3 Credits**

Description and analysis of prehistoric archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures.

**Prerequisite:** ANTH 315.

**ANTH 472. Primate Behavior and Ecology****3 Credits**

Survey of the social behavior and ecology of nonhuman primates.

Crosslisted with: BIOL 472.

**ANTH 473. Primate Adaptation and Evolution****3 Credits**

Survey of the adaptations and evolutionary history of nonhuman primates. Crosslisted with: BIOL 423.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** ANTH 473 L when offered.

**ANTH 474. Human Osteology****3 Credits**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 424.

**ANTH 474 L. Human Osteology Lab****1 Credit**

Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: BIOL 424 L.

Recommend Prerequisite is ANTH 355 or equivalent.

**Corequisite(s):** ANTH 474.

**ANTH 477. Zooarchaeology****3 Credits**

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. May be repeated up to 3 credits.

**ANTH 485. Special Research Project****1-3 Credits**

Anthropological, archaeological, or museum field work or laboratory experience in academic, private, state, or federal agencies. Must spend 30 hours in a field, museum, or laboratory setting per credit hour earned. May be repeated up to 6 credits.

**Prerequisite(s):** Complete 12 ANTH credits and consent of instructor.

**ANTH 486. Community Engagement and Service Learning****3 Credits**

Course combines classroom instruction with a local community service project. Formal instruction component will examine social science research findings and perspectives on a locally relevant social issue or problem. In the service learning component, students will be trained and work on a local community service project. Students will develop field experience and methodological skills in community engagement. Projects and social issues may vary for different semesters.

**ANTH 488. Archaeological Field School Advanced****1-6 Credits**

Archaeological field methods, including excavations of prehistoric sites, record keeping, mapping and analysis of data. Consent of Instructor required.

**ANTH 497. Special Topics****1-6 Credits (1-6)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** Junior or above standing.

**ANTH 500. Seminar in Anthropological Theory****3 Credits**

Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 502. Fundamentals of Anthropology****1-4 Credits (1-4)**

Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. Graded S/U.

**ANTH 504. Cultures of Africa****3 Credits**

Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental challenges such as deforestation are discussed. Taught with ANTH 404. Crosslisted with: HIST 504

**ANTH 505. Issues in Anthropological Practice****3 Credits**

Anthropological approaches to research design, implementation, and dissemination. Restricted to: Main campus only.

**ANTH 506. Advanced Studies in Physical Anthropology****1-3 Credits**

Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 507. Advanced Studies in Archaeology****1-3 Credits**

Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 508. Advanced Studies in Cultural Anthropology****1-3 Credits**

Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 509. Advanced Studies in Anthropological Linguistics****1-3 Credits**

Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.

**ANTH 512. Analytical Methods in Anthropology****3 Credits**

Quantitative analytical methods of anthropology examined in detail. Applied problem sets include physical and cultural anthropology, linguistics, and archaeology.

**Prerequisite:** graduate standing or consent of instructor.

**ANTH 513. Biological Anthropology****3 Credits**

Examination of major theoretical and methodological issues in biological anthropology.

**ANTH 515. Applied Anthropology****3 Credits**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.

**ANTH 516. Advanced Archaeology of the American Southwest****3 Credits**

Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.

**ANTH 517. Advanced Topics in Mesoamerican Archaeology****3 Credits**

Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**Prerequisite:** graduate standing.

**ANTH 518. Advanced Historical Archaeology****3 Credits**

Advanced methodological and theoretical concepts applicable to the archaeology of historic periods.

**ANTH 519. Advanced Topics in Prehistoric Archaeology****3 Credits**

Seminar on specialized research archaeology.

**Prerequisite:** graduate standing.

**ANTH 520. Ethnographic Field Methods****3 Credits**

Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.

**ANTH 521. Advanced Anthropologist Study Odyssey****3-6 Credits (3-6)**

This course allows students to explore an anthropological topic, such as an archaeological tradition or culture, through classroom and field activities. Students are initially exposed to a topic during several days of intensive in class work and then pursue greater understanding of the topic through a field trip and possibly limited fieldwork. Readings, site tours, on-site lectures by specialists, and field exercises provide students an opportunity to develop an understanding of anthropological perspectives on the topic as well as to provide exposure to anthropological field and analytic methods. This course also allows students to experience other cultures, prehistoric sites, and/or locales firsthand. May be repeated for credit under a different odyssey title. Taught with ANTH 386. May be repeated up to 6 credits. Consent of Instructor required.

**ANTH 522. Archaeological Field School-Graduates****2-6 Credits**

Techniques of archaeological data collection, analysis, and interpretation. Emphasis on archaeological field work in the Southwest.

**ANTH 523. Archaeological Mapping****3-6 Credits (3-6)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software.

**ANTH 526. Conquest and Colonialism****3 Credits**

Examination of major theoretical and methodological issues in historical anthropology and archaeology of the Americas from AD1500 to present, including conquest, colonialism, capitalism, and modernity as anthropological processes. The contributions and limitations of historical, ethnohistorical, and archaeological evidence are emphasized.

**Prerequisite(s):** graduate standing in Anthropology or History or consent of instructor.

**ANTH 531. Issues in Nutritional Anthropology****3 Credits**

Evolutionary and cross-cultural perspective on human nutrition.

**ANTH 534. Advanced Human Evolution****3 Credits**

Advanced overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. May be repeated up to 3 credits. Crosslisted with: BIOL 534.

**ANTH 534 L. Advanced Human Evolution Lab****1 Credit**

Advanced laboratory in human evolution, includes exercises and activities to learn the human fossil record. Crosslisted with: BIOL 534 L.

**Corequisite(s):** ANTH 534.

**ANTH 537. Applied Medical Anthropology****3 Credits**

This course introduces students to applications of medical anthropological perspectives to health care, international development, public health, and health policy.

**ANTH 538. Plants, Culture, and Sustainable Development****3 Credits**

Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnobotany, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.

**ANTH 539. Culture and Foodways****3 Credits**

Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.

**ANTH 540. Cultural Resource Management****3 Credits**

Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.

**ANTH 541. Decolonizing Methodologies in Native American Studies****3 Credits**

This course utilizes decolonizing methodologies and praxis to gain insight into the complex effects of oppression and colonization. Critical and indigenous concepts are used to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Research theory and methodology such as community participatory action research that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people is emphasized.

**ANTH 542. Cultural Resource Management II****3 Credits**

Continuation of ANTH 540 to include the study of cultural resource management practices, research design, and completion of proposals in response to requests. Overview of management practices and budgeting of projects and specialized studies (geophysical investigations, National Register nominations).

**ANTH 543. Indigenous Ways of Knowing****3 Credits**

This course examines Indigenous knowledge and ways of knowing as a means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather than comparative analysis.

**ANTH 545. Advanced Museology I****3 Credits**

Museum philosophy, history, administration, and collection management. Emphasis on collecting, cataloging, care, and exhibition, as well as ethics, public responsibility, and grantsmanship.

**ANTH 546. Advanced Contemporary Medical Anthropology****3 Credits**

This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health inequalities, and the political economy of infectious disease. Taught with ANTH 402.

**ANTH 547. Museum Field Methods****3 Credits**

Basic methodologies used in conducting museum research away from the museum, including collections evaluation, collections acquisition, donor interviews, educational outreach, and development.

**ANTH 548. Museums & Society****3 Credits**

Examines theoretical frameworks that shape museum administration, exhibits and collections development. Examines themes of gender, space, place, multiculturalism, national and international politics in museum contexts.

**ANTH 556. Advanced Native American Intersections in Museums****3 Credits**

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 456.

**ANTH 559. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as GOVT 565 and HIST 559.

**ANTH 572. Advanced Primate Behavior and Ecology****3 Credits**

Advanced review of non-human primate social behavior and ecology. Crosslisted with: BIOL 572.

**ANTH 573. Advanced Primate Adaptation and Evolution****3 Credits**

Advanced review of non-human primate adaptation and evolution. Crosslisted with: BIOL 503.

**Corequisite(s):** ANTH 573 L when offered.

**ANTH 574. Advanced Human Osteology****3 Credits**

Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 574.

**ANTH 574 L. Advanced Osteology Laboratory****1 Credit**

Laboratory for ANTH 574. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: BIOL 574 L.

**Corequisite(s):** ANTH 574.

**ANTH 576. Lithic Technology Organization****3 Credits**

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data. Consent of Instructor required.

**ANTH 577. Advanced Zooarchaeology****3 Credits**

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.

**ANTH 578. Advanced Lab Methods in Archaeology****3 Credits**

Examination of advanced laboratory techniques used in the analysis of archaeological materials.

**ANTH 579. Qualitative Data Analysis and Interpretation****3 Credits**

This course focuses on methods for qualitative data analysis, both computer-assisted and non-computer-assisted, and interpretation. It includes writing up data for academic articles or theses.

**ANTH 585. Method and Theory in Archaeology****3 Credits**

Focus on major methodological and theoretical aspects of contemporary archeology.

**ANTH 587. Field Work in Latin America****3-12 Credits**

Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. No S/U grading.

**Prerequisite:** consent of instructor.

**ANTH 596. Readings****1-6 Credits**

Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.

**ANTH 597. Internship****1-9 Credits**

Anthropological or archaeological internship in private, state, or federal agency. May be repeated for a maximum of 18 credits. Consent of instructor required. Restricted to ANTH majors.

**Prerequisite(s):** graduate standing.

**ANTH 598. Special Research Problems****1-6 Credits (6)**

Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required. Restricted to ANTH majors.

**Prerequisite(s):** graduate standing.

**ANTH 599. Master's Thesis****15 Credits**

Thesis. Consent of instructor required. Restricted to ANTH majors.

**Prerequisite(s):** graduate standing.

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**Website:** <http://anthropology.nmsu.edu>

## Anthropology - Bachelor of Arts

The field of anthropology provides a broadly based education in the social and biological sciences. Undergraduate anthropology majors develop an understanding of human diversity that will benefit them in a wide variety of careers. They have particular advantage in positions that require contact with different cultures and ethnic groups or with large organizations that provide human services.

Students intending to become professional anthropologists usually plan to go on for an advanced degree. They can pursue careers in teaching, archaeological research, museums, public and private cultural resource management, international development and business, human services and health care, forensic sciences, urban planning, agricultural development, and administration. While anthropology is a traditional academic discipline, it also has become an applied profession.

Today, many anthropologists hold important positions in government, business, public policy organizations, and health professions. Anthropology's broad perspective on human diversity and intercultural relations provides students with valuable professional skills. NMSU anthropologists are committed to teaching practical knowledge and useful skills that will contribute to students' career goals and to their intellectual development.

## Requirements

### Departmental Requirements

ANTH 301	Cultural Anthropology	3
ANTH 315	Introduction to Archaeology	3
ANTH 320	Anthropological Linguistics	3
ANTH 350	Anthropological Theory	3
ANTH 355	Physical Anthropology	3
ANTH 399	Professionalism & Practice in Anthropology	3

ANTH 301, ANTH 315, ANTH 320, and ANTH 355 may be taken in any order that best suits the student's interests.

### Nondepartmental Requirements <sup>1</sup>

Select one English course from the following list		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	

ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Select one Mathematics course from the following list		3
MATH 210G	Mathematics Appreciation	
STAT 251G	Statistics for Business and the Behavioral Sciences (recommended)	
Select two Viewing the Wider World Courses <sup>2</sup>		6
<b>Electives</b>		
Select additional electives in anthropology to bring total credits in major to 36, including 27 upper-division.		12
Select sufficient electives to bring total credits to 120, including 48 upper-division.		78
<b>Second Language Requirement: (required- see below)</b>		
Total Credits		120

<sup>1</sup> A grade of C- or better must be earned.

<sup>2</sup> Students must complete two Viewing the Wider World Courses (VWW) for a total of 6 credits. One VWW must be from outside of the College of Arts and Sciences, and the second must be from outside of Anthropology. A student may substitute three credits taken as study abroad for one of the VWW course requirements.

## Second Language Requirement

For the Bachelor of Arts in Anthropology there is a two year second language requirement, the student must do one of the following:

### Option 1:

**Complete one of the following sequences:**

CHIN 111 & CHIN 112 & CHIN 211 & CHIN 212	Elementary Chinese I and Elementary Chinese II and Intermediate Chinese I and Intermediate Chinese II	14
FREN 111 & FREN 112 & FREN 211 & FREN 212	Elementary French I and Elementary French II and Intermediate French I and Intermediate French II	14
GER 111 & GER 112 & GER 211 & GER 212	Elementary German I and Elementary German II and Intermediate German I and Intermediate German II	14
JPNS 111 & JPNS 112 & JPNS 211 & JPNS 212	Elementary Japanese I and Elementary Japanese II and Intermediate Japanese I and Intermediate Japanese II	14
SPAN 111 & SPAN 112 & SPAN 211 & SPAN 212	Elementary Spanish I and Elementary Spanish II and Intermediate Spanish I and Intermediate Spanish II	14
PORT 213 & PORT 214	Portuguese for Romance Language Students I and Portuguese for Romance Language Students II	6

### For Heritage Speakers:

SPAN 113 & SPAN 213 & SPAN 214	Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	9
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**Option 2:**

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3
C D 476	American Sign Language III	3

**Option 3:**

Challenge the 212 level for the following courses:

CHIN 212	Intermediate Chinese II	3
or FREN 212	Intermediate French II	
or GER 212	Intermediate German II	
or JPNS 212	Intermediate Japanese II	
or SPAN 212	Intermediate Spanish II	

OR

Challenge the 214 level for the following courses:

PORT 214	Portuguese for Romance Language Students II	3
or SPAN 214	Spanish for Heritage Learners III	

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Anthropology Plan of Study

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ENGL 111G	Rhetoric and Composition	4
or ENGL 111GH	or Rhetoric and Composition Honors	
Select one of the following Mathematics courses		3
MATH 210G	Mathematics Appreciation	
STAT 251G	Statistics for Business and the Behavioral Sciences (recommended)	
Select one of the Anthropology Area IV Gen Ed Courses		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	

ANTH 202G	World Archaeology	
HON 235G	Window on Humanity	
HON 237G	Archaeology: Search for the Past	
Area V Humanities and Fine Arts		3
Second Language 111 or Placement		4
Credits		17

**Spring**

ANTH 130G	Human's Place in Nature: Introduction to Biological Anthropology	3
ANTH 130GL	Human's Place in Nature Laboratory	1
Area I Communications, select one of the following		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
HON 265G	Principles of Human Communication Honors	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
Area IV Social/Behavioral Sciences: Anth 120G, Anth 125G, Anth 201G, and Anth 202G count as Area IV and the major		3
Area V Humanities and Fine Arts		3
Second Language 112		4
Credits		17

**Second Year****Fall**

ANTH 301	Cultural Anthropology <sup>1</sup>	3
Non-Departmental Area I English, select one of the following		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Second Language 211 <sup>2</sup>		3
Area IV or V General Education course		3
Elective		3
Credits		15

**Spring**

ANTH 315	Introduction to Archaeology <sup>3</sup>	3
Area III Laboratory Science with Lab		4
Second Language 212 <sup>2</sup>		3
Elective		3
Elective		3
Credits		16

**Summer**

Anthropology and Archaeology Field Schools are typically offered in Summer

ANTH 388	Intermediate Archaeological Field School	
ANTH 488	Archaeological Field School Advanced	
Credits		0

**Third Year****Fall**

ANTH 320	Anthropological Linguistics <sup>1</sup>	3
VWW Course <sup>4</sup>		3

Anth Elective - any level	3
Minor <sup>5</sup>	3
Elective	3
Credits	15
<b>Spring</b>	
ANTH 355 Physical Anthropology <sup>1</sup>	3
ANTH 399 Professionalism & Practice in Anthropology (offered only in Spring semester) <sup>6</sup>	3
VWW Course	3
Minor	3
Minor	3
Credits	15
<b>Summer</b>	
Archaeological Field School <sup>8</sup>	
Ethnographic Field School <sup>8</sup>	
Study Abroad	
Credits	0
<b>Fourth Year</b>	
<b>Fall</b>	
ANTH 350 Anthropological Theory (offered only in fall semester) <sup>7</sup>	3
Anthropology - Upper Division Elective <sup>7</sup>	3
Minor - upper division	3
Minor - upper division	3
Elective - upper division	3
Credits	15
<b>Spring</b>	
Anthropology - upper division elective	3
Anthropology - upper division elective	3
Minor - upper division	3
Additional elective	3
Credits	12
Total Credits	122

<sup>1</sup> Core courses Anth 301, Anth 315, Anth 320, and Anth 355 may be taken in any order that best suits the student's academic development.

<sup>2</sup> Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence.

<sup>3</sup> Summer Course offerings commonly include Anth 388, Anth 488 Archaeological Field School, which follows logically from the Anth 315 core class.

<sup>4</sup> Students are encouraged to Study Abroad or begin a minor in a related field, and a VWW course can often be an entry to a minor. Three credits of Study Abroad may substitute for one VWW requirement.

<sup>5</sup> Anthropology students often complete minors in related fields. It is recommended but not required. See faculty for advice about how to enhance your educational development with a minor.

<sup>6</sup> Please note that Anth 399 is a capstone course for the degree and ideally should be taken in the Spring of the junior year, after completion or in conjunction with the Anthropology core courses. Anth 399 is only offered in the Spring semester.

<sup>7</sup> A minimum of 27 upper division credits in Anthropology is required overall. A minimum of 36 total credits in Anthropology is required for the B.A. degree.

<sup>8</sup> For summer field opportunities, consult a faculty advisor. Applications for summer field courses are usually due by mid March. Honors students in Anthropology are encouraged to seek out National Science Foundation - Research Experiences for Undergraduates Sites Programs in the Division of Social and Behavioral Sciences. The NMSU Honors College also offers the Honors College Scholarship for a self-designed international travel and research experience. Sophomore and Junior Crimson Scholars are eligible to apply.

## Anthropology - Undergraduate Minor

Students who earn a minor in Anthropology must earn 18 credits, distributed as follows:

### Required Courses

Select one from the following:	3
ANTH 301 Cultural Anthropology	
ANTH 315 Introduction to Archaeology	
ANTH 320 Anthropological Linguistics	
ANTH 350 Anthropological Theory	
ANTH 355 Physical Anthropology	
Upper division Anthropology courses 300 or above	9
Anthropology courses (any level)	6
Total Credits	18

Students who earn a B.A. in Anthropology may **not** also earn a minor in Anthropology. Students earning the minor must pass 18 credits with grades of C- or higher. Nine of the credits must be upper-division. Students may count S only in courses in which all grades are S/U.

## Native American Studies - Undergraduate Minor

Students must pass a total of 18 credits of which at least 9 of which must be upper division. ANTH 115 Native Peoples of North America is the required course for the minor. A grade of C- or better must be obtained for each course. Students may count S grades only in courses in which all grades are S/U, and no more than 6 hours of S credit can be accepted. Students may count no more than 9 credits in Anthropology. Please contact the Department of Anthropology regarding the minor.

### Requirements

Required Course	3
ANTH 115 Native Peoples of North America	
Select 15 credits from the following: <sup>1</sup>	15
At least nine credits must be upper division	
ANTH 116 Native Peoples of the American Southwest	
ANTH 305V Contemporary Native Americans (preferred core course)	
ANTH 316 Archaeology of the American Southwest	
ANTH 330V Magic, Witchcraft and Religion	
ANTH 449 Directed Reading	

ANTH 455	Federal Indian Policy (preferred core course) <sup>2</sup>
ANTH 456	Native American Intersections in Museums
ANTH 467	Archaeology of the American Southwest
ANTH 497	Special Topics (Decolonizing Methodologies or Indigenous Ways of Knowing)
BLAW 430V	American Indian Law and Policy (substitutes for Anth 455 Federal Indian Policy)
GOVT 354	American Indian Politics
HON 340V	Indian Law and Policy
HON 362V	Native American Philosophy and Spirituality (substitutes for Anth 497 Special Topics)
<b>Total Credits</b> 18	

<sup>1</sup> Course substitutions require approval of the Director of the Native American Studies minor, Dr. Donald Pepion [dpepion@nmsu.edu](mailto:dpepion@nmsu.edu) (<http://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/native-american-studies-undergraduate-minor/Mailto:>)

<sup>2</sup> Anth 455 Federal Indian Policy is cross listed with Hon 430V Indian Law and Policy.

## Sustainable Development - Undergraduate Minor

The Undergraduate Minor in Sustainable Development is an interdisciplinary program through which students develop a deeper understanding of the relations between humans and the natural environment. The minor offers students the opportunity to cross disciplines and construct a coherent interdisciplinary program that focuses on human interactions with the natural environment, society's role in depleting and transforming natural resources, critical issues in sustainable development, and new strategies for conserving natural resources and sustainable agricultural production.

NMSU occupies a unique strategic position as a land grant institution in a multi-cultural regional setting, combined with its geographic location on a binational border. Students in different programs can use the minor in sustainable development to enhance their undergraduate degrees and prepare themselves professionally to seek careers and graduate degrees in sustainable and international development.

A minor in sustainable development is available for students who want to include sustainable development in their academic training. The minor requires **18 credit hours, nine of upper division courses**, broken down in the following way:

- 6 credit hours of core requirements,
- 9 credit hours of elective courses, and
- 3 credit hours of field study

### Requirements

- Core Courses 6
- Select six credits from the following list
- AG E 315V World Agriculture and Food Problems

ANTH 360V	Food and Culture Around the World
BIOL 301	Principles of Ecology
GEOG 295	Introduction to Climate Science
SOC 465V	Environmental Sociology
<b>Electives</b> 9	
Select nine credits from the following list	
AG E 337V	Natural Resource Economics
AGRO 483	Sustainable Production of Agronomic Crops
ANTH 362	Environmental Anthropology
BIOL 462	Conservation Biology
EPWS 380V	Science & Society
FWCE 255	Principles of Fish and Wildlife Management
HON 305V	Global Environment
HON 321V	Agriculture in an Interconnected World
SOC 361V	Social Issues in the Rural Americas

With permission of the minor advisor, students may substitute one class that presents a topical focus on sustainable development

**Field Requirements** 3

Select three credits from the following courses

ANTH 385	Internship in Anthropology
FWCE 450	Special Topics
SOC 496	Internship

**Total Credits** 18

## Religious Studies - Undergraduate Minor

Students must pass 18 credits of which at least 9 are upper division. Students must earn C- or higher grades and cannot count S/U courses unless all grades in the course must be S/U. No more than 9 credits (upper or lower division) can be earned in any one department. Students may not earn more than 3 credits total in independent studies or special readings courses and must receive approval from the minor advisor to count these credits. Courses that may be eligible as special topics courses when offered with specific subtitles are asterisked. Please contact the Department of Anthropology regarding the minor.

### Requirements

#### Required Courses

ANTH 330V	Magic, Witchcraft and Religion	3
Select 15 credits from the following: <sup>1</sup>		15
At least 9 credits must be upper division		
ANTH 115	Native Peoples of North America	
ANTH 313	Ancient Mexico	
ANTH 455	Federal Indian Policy	
ART 305	Medieval Art	
ART 310	Native American Art	
ART 311	Art of China I: Neolithic to Song Dynasty	
ART 320	Art and Architecture in Pre-Columbian Meso-America	

ART 321	Pre-Columbian Art and Architecture of the Andes
ART 323	Italian Renaissance Art
ART 325	Northern Renaissance Art
DANC 451V	World Dance
ENGL 243	The Bible as Literature
ENGL 341V	American Indian Literature
ENGL 392V	Mythology
ENGL 407	Milton
ENGL 493	Middle English Textual Cultures
GOVT 387	Religion and Politics
HIST 211G	East Asia to 1600
HIST 221G	Islamic Civilizations to 1800
HIST 222G	Islamic Civilizations since 1800
HIST 353	Colonial Mexico
HIST 425V	History of Magic and Witchcraft in Medieval and Renaissance Europe
HIST 471	China through the Ming Dynasty
HIST 473	History of Japan
HON 229G	The New Testament as Literature
HON 234G	The Worlds of Arthur
HON 237G	Archaeology: Search for the Past
HON 239G	Medieval Understandings: Literature and Culture in the Middle Ages
HON 326V	Art and Mythology
HON 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle
HON 362V	Native American Philosophy and Spirituality
HON 366V	The Gothic Imagination
PHIL 136G	The Quest for God
PHIL 331	Philosophy of Religion
SOC 460	Sociology of Religion
Or by approval of Minor Advisor	

Total Credits 18

## Anthropology - Master of Arts

The Anthropology M.A. program is designed for students who are interested in the traditional sub-disciplines of anthropology, as well as such related fields as cultural resource management, food studies, medical anthropology, and museum studies. The program is directed to both students planning to complete a professional M.A. degree and students planning to enter a Ph.D. program. In addition to the M.A. in Anthropology, our program offers graduate minors in anthropology, food studies, and Native American Studies, as well as Graduate Certificates in cultural resource management and museum studies. The faculty encourage all graduate students to develop graduate minors and certificates, enhancing their specialized training in anthropology.

An undergraduate anthropology degree is not required for entry into the M.A. program. Applicants who lack the equivalent of ANTH 301, ANTH 315, ANTH 320, and ANTH 355 may be required to take these courses or corresponding sections of ANTH 502. ANTH 350 or the equivalent is recommended. Applicants without an undergraduate degree

in anthropology are encouraged to contact the Graduate Advisor before applying to the M.A. program in anthropology.

ANTH 301	Cultural Anthropology
ANTH 315	Introduction to Archaeology
ANTH 320	Anthropological Linguistics
ANTH 350	Anthropological Theory
ANTH 355	Physical Anthropology

## Program Requirements

Students selecting the thesis option must complete 33 hours of basic course work, as described below, plus 6 hours of thesis credit. Students selecting the non-thesis option must complete 39 hours of course work including an internship or special research project for 6 credits.

The 33 hours of basic course work for students selecting either the thesis or non-thesis options are distributed as follows:

<b>Core Theory Courses</b>	6
Select two of the following core theory courses, one in the student's principal subfield and the second in an alternative subfield: <sup>1</sup>	
ANTH 500 Seminar in Anthropological Theory (for students in cultural anthropology and anthropological linguistics subfields)	
ANTH 513 Biological Anthropology (for students in biological subfield)	
ANTH 585 Method and Theory in Archaeology (for students in archaeology subfield)	
<b>Core Course in Professionalism and Practice</b>	3
ANTH 505 Issues in Anthropological Practice	
<b>Additional Courses</b>	
Select additional topical, methodological, and area courses in anthropology <sup>1</sup>	24
Note that only 6 credits taken outside of Anthropology may count toward the total credits required for the M.A. degree	
<b>Thesis or Non-Thesis Options</b>	
Select one of the following:	6
<i>Thesis</i>	
ANTH 599 Master's Thesis	
<i>Non-Thesis</i>	
ANTH 597 Internship or ANTH 598 Special Research Problems	
Total Credits	39

<sup>1</sup> earning a grade of B or better

## Admission Requirements

To apply to the Anthropology Masters Degree program the following materials are required:

- Graduate School application form and fees
- Official undergraduate and graduate transcripts from all colleges and universities attended, with a 3.0 GPA minimum.
- A letter from the candidate addressing his or her interests and graduate school objectives

- Letters of recommendation from three persons familiar with the candidate's academic record

**All the above items should be submitted through the Graduate School's central admission system at: <http://gradadmissions.nmsu.edu/how-to-apply/>**

**NOTE:** In addition to the above, **international applicants** also need to view the requirements of admission to the university and provide additional documentation online, at this page: <https://isss.nmsu.edu/index-2/>

**NOTE:** students may matriculate in either August or January. If a student wishes to be considered for a Graduate Assistantship, the application must be completed by **February 15** for admission in the fall semester. Assistantships are not usually offered for students matriculating in January, but they may be considered in subsequent semesters for an award.

**For more information about the Anthropology Graduate Program contact:**

Dr. Lois Stanford, Anthropology Graduate Advisor at: lgradadv@nmsu.edu (stanfor@nmsu.edu (<http://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-master-arts/Mailto:>))

Dr. Rani Alexander, Anthropology Department Head at: raalexan@nmsu.edu (<http://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-master-arts/Mailto:>)

## Cultural Resource Management - Graduate Certificate

The Graduate Certificate in Cultural Resource Management provides specialized archaeological training that enables students to pursue careers cultural resource management, heritage, and historic preservation in the public or private sectors. The curriculum includes cultural resource management and historic preservation laws and regulations, area classes in prehistoric and historical archaeology, field classes, and laboratory methods courses in archaeology, history, and geography. Students take courses in traditional classroom and laboratory formats, as well as in the field, and may complete the certificate in one year.

The Certificate may be completed as a stand alone certification or in conjunction with the M.A. degree in Anthropology or any other related field.

If you wish to complete a graduate certificate, you must apply (<https://gradschool.nmsu.edu/apply>) for admission to this non-degree program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to file a Completion of Graduate Certificate form ([https://gradschool.nmsu.edu/wp-content/uploads/sites/5/2015/04/certificate\\_completion\\_of\\_graduate\\_certificate.pdf](https://gradschool.nmsu.edu/wp-content/uploads/sites/5/2015/04/certificate_completion_of_graduate_certificate.pdf)) to be awarded the certificate.

Important information about the educational debt, earnings, and completion rates of students who attend this program can be found on the following: Gainful Employment Disclosure (<https://nmsu.edu/gainfulemployment/crm/45.0301-Gedt.html>).

Please contact the Anthropology Graduate Advisor, Dr. Lois Stanford lstanfor@nmsu.edu (<http://catalogs.nmsu.edu/nmsu/arts-sciences/>)

anthropology/cultural-resource-management-graduate-certificate/Mailto:) for information about how to complete the application.

The Graduate Certificate in Cultural Resource Management requires 18 credits of coursework and must be completed within 3 years. The certificate requires six credits from two required courses and 12 credits from a comprehensive list of electives in anthropology and cognate fields. Students are required to take at least one course in History or Geography. All these courses are designed to promote expertise in cultural resource management.

### Required Courses

ANTH 540	Cultural Resource Management	3
ANTH 542	Cultural Resource Management II	3

### Elective Courses

Select 12 credits from the following: <sup>1,2</sup>

At least three credits must be in HIST or GEOG		
ANTH 455	Federal Indian Policy	
ANTH 507	Advanced Studies in Archaeology	
ANTH 512	Analytical Methods in Anthropology	
ANTH 516	Advanced Archaeology of the American Southwest	
ANTH 518	Advanced Historical Archaeology	
ANTH 522	Archaeological Field School-Graduates	
ANTH 523	Archaeological Mapping	
ANTH 574	Advanced Human Osteology	
ANTH 576	Lithic Technology Organization	
ANTH 577	Advanced Zooarchaeology	
ANTH 578	Advanced Lab Methods in Archaeology	
ANTH 597	Internship	
GEOG 553	Geomorphology	
GEOG 573	Introduction to Remote Sensing	
GEOG 578	Fundamentals of Geographic Information Science and Technology (GIS & T)	
HIST 579	Oral History	
HIST 586	Interpreting Historic Places for the Public	
HIST 583	Advanced Historic Preservation	
HIST 594	Public History Seminar	

Total Credits 18

<sup>1</sup> Some of these courses have prerequisites, consult the graduate catalog for details.

<sup>2</sup> Other classes maybe included in the list of elective courses at the discretion of the Department and with approval of the Anthropology Department Head.

## Museum Studies - Graduate Certificate

The Graduate Certificate in Museum Studies provides specialized interdisciplinary training that enables students to pursue careers in museums in the public or private sectors. The curriculum includes museology, methods, exhibit development, collections management, conservation, curation, and practice in Museum Studies. Students take courses in traditional classroom and practicum formats and may complete the certificate in one year.

The Certificate may be completed as a stand alone certification or in conjunction with the M.A. degree in Anthropology, History, Art, and related fields.

If you wish to complete a graduate certificate, you must apply (<https://gradschool.nmsu.edu/apply>) for admission to this non-degree program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to file a Completion of Graduate Certificate form ([https://gradschool.nmsu.edu/wp-content/uploads/sites/5/2015/04/certificate\\_completion\\_of\\_graduate\\_certificate.pdf](https://gradschool.nmsu.edu/wp-content/uploads/sites/5/2015/04/certificate_completion_of_graduate_certificate.pdf)) to be awarded the certificate.

Important information about the educational debt, earnings, and completion rates of students who attend this program can be found on the following: Gainful Employment Disclosure (<https://nmsu.edu/gainfulemployment/crm/45.0301-Gedt.html>).

Please contact the Anthropology Graduate Advisor for information about how to complete the application.

The Certificate in Museum Studies is a 3 semester (or one year and one summer) program designed for individuals who want to enhance their understanding of museum work. It may be completed as a stand alone certification or in conjunction with a Master's degree in Public History, History, Art History, Anthropology, Studio Art or other disciplines.

#### Core Curriculum

ANTH 545	Advanced Museology I	3
ART 503	Preventive Conservation/Collections Care	3
HIST 594	Public History Seminar	3
Internship (credits from ANTH, ART, or HIST)		3

#### Controlled Electives

Select two from the following: <sup>1</sup> 6

ANTH 508	Advanced Studies in Cultural Anthropology (Museum Confidential or Visual Anthropology)	
ANTH 540	Cultural Resource Management	
ANTH 547	Museum Field Methods	
ANTH 548	Museums & Society	
ANTH 556	Advanced Native American Intersections in Museums	
ART 501	Museum Conservation Techniques I	
ART 502	Museum Conservation Techniques II	
ART 579	Graduate Seminar: Art Theory, Criticism, Historiography	
HIST 579	Oral History	
HIST 581	Time Traveling Through New Mexico's Past	
HIST 583	Advanced Historic Preservation	
HIST 586	Interpreting Historic Places for the Public	

Total Credits 18

<sup>1</sup> This list is regularly modified as new courses are added to the catalog, or old ones are phased out. Eligible courses are determined by a committee with at least one representative from Art, Anthropology and History. Substitutions may be approved with the advice of Museum Studies Faculty in Art, History, and Anthropology by the Department Head of Anthropology.

## Anthropology - Graduate Minor

For the minor in anthropology, students are required to complete at least 9 credits (3 courses) of graduate-level anthropology coursework at the level of 500 or above. A minor in anthropology provides a useful concentration for students developing professional careers in teaching, environmental sciences, international business, community development, social work, art, and historic preservation. We recommend that students consult the anthropology graduate advisor and focus their coursework in the appropriate subfield.

To include a minor on a student's transcript, the minor must be listed on the NMSU Graduate Program of Study, and this form must be signed by the anthropology graduate advisor. Graduate students majoring in anthropology may **not** also earn a minor in the same field.

## Archaeology - Graduate Minor

### Graduate Minor in Archaeology

The graduate minor in archaeology allows students in other programs to develop a specialization in archaeology. A minor in archaeology provides a useful concentration for students developing professional careers in cultural resource management, public lands management, environmental sciences, public history, geography, or teaching.

#### Course Requirements:

In order to complete the minor requirements, students are required to complete 9 credit hours (3 classes) of graduate level courses. The core courses for the minor are:

ANTH 507	Advanced Studies in Archaeology	1-3
ANTH 516	Advanced Archaeology of the American Southwest	3
ANTH 517	Advanced Topics in Mesoamerican Archaeology	3
ANTH 518	Advanced Historical Archaeology	3
ANTH 522	Archaeological Field School-Graduates	2-6
ANTH 523	Archaeological Mapping	3-6
ANTH 540	Cultural Resource Management	3
ANTH 577	Advanced Zooarchaeology	3
ANTH 585	Method and Theory in Archaeology	3

Students should choose among these core offerings with the advice of their MA thesis chair and minor area committee member. The minor in archaeology is not available to graduate anthropology majors.

## Food Studies - Graduate Minor

The purpose of the Food Studies Graduate Minor is to:

1. Enable students to develop a specialization in food studies within their respective graduate program

2. Develop specialized knowledge of the complex and dynamic relationship between food and culture
3. Explore the role of culture in food production, distribution and consumption across different cultures
4. Apply ideas and knowledge from graduate seminars to fieldwork for MA thesis or internship in a food studies topic

## Program Requirements

### Core Curriculum

Select three from the following: <sup>1</sup> 9

ANTH 520	Ethnographic Field Methods	9
ANTH 531	Issues in Nutritional Anthropology	
ANTH 538	Plants, Culture, and Sustainable Development	
ANTH 539	Culture and Foodways	
ANTH 515	Applied Anthropology <sup>2</sup>	
ANTH 537	Applied Medical Anthropology <sup>2</sup>	
Total Credits		9

<sup>1</sup> Alternative classes may be substituted for one of the core classes with the approval of the Anthropology Department Head.

<sup>2</sup> In these cases, the student's class research project should focus on a food studies theme.

Students are expected to conduct a food studies thesis, applying anthropological theoretical frameworks and ethnographic methodologies to the study of a food-related topic. Non-thesis students may select a food studies internship. Possible topics include sustainable development, alternative food movements, community food security, community health, nutrition, food safety, globalization of food, indigenous knowledge systems, food self-sufficiency, among others.

## Native American Studies - Graduate Minor

The purpose of the Native American Studies Graduate Minor are to:

- Provide an opportunity for all students to learn about Native American cultures and societies.
- Facilitate research and other creative activities that concern Native American peoples and that have potential benefit for them.
- Serve the University and State of New Mexico in ways that support and illuminate the rich heritage of Native American peoples.

The Graduate minor in Native American Studies focuses on Native American cultures and societies, deals with contemporary and historical experiences of American Indians, and examines the contributions of Indigenous peoples to life in the United States and other American nations. This specialization has developed in reaction to Western academic views of Native Americans and to the frequently restrictive, assimilationist approach within universities to issues concerning Native peoples. NAS contributes to a new understanding of Native American cultures and societies from contemporary and historical perspectives.

To qualify for a graduate minor in Native American Studies, students are required to complete 9 credit hours (3 classes) of graduate level courses. To record a minor on a student's transcript, the minor must be listed on

the Graduate School's Program of Study form, and the Native American Studies advisor in the Department of Anthropology must sign this form.

**Core Courses: Choose nine credit hours from the courses on the list** 9

ANTH 541	Decolonizing Methodologies in Native American Studies	9
ANTH 543	Indigenous Ways of Knowing	
ANTH 455	Federal Indian Policy	
ANTH 556	Advanced Native American Intersections in Museums	
HIST 509	Native American History <sup>1</sup>	
Total Credits		9

<sup>1</sup> Alternative classes may be substituted with the approval of the student's MA chair and the Director for the Graduate Minor in Native American Studies, Dr. Donald Pepion [dpepion@nmsu.edu](mailto:dpepion@nmsu.edu) (<http://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/native-american-studies-graduate-minor/Mailto:>).

## Art

### Undergraduate Program Information

Within the scope of the university's land-grant mission, the Department of Art utilizes our unique geographic location to serve and reflect diverse border communities, support learning that combines innovative and hybrid techniques, critical and cultural theory, contemporary exhibitions, and art historical inquiry. Capitalizing on the specialties and research agendas of our faculty, we provide an environment and a platform for aesthetic and critical engagement through the application of studio and art historical methodologies. Our curriculum fosters learning through experimental immersion in collaborative and cross-disciplinary activity. Students develop their artistic aesthetic and professional growth through engagement with a variety of approaches to individual research practice. Student's research also includes critique and discourse related to the context of both historical and contemporary issues, and the development of new strategies of inquiry into contemporary culture and knowledge. As artists, historians, and conservators, we provide a space for active engagement with varied disciplines in local, national and international communities.

The department offers a BA in Studio Art or Art History and a BFA in Studio Art or Museum Conservation. The study of art provides an appropriate background for the pursuit of careers in studio art and art history in such areas as: the visual arts; graphic design; conservation; library work; museum work; advertising; architecture and interior design; photography; crafts; cinematography; education and art therapy; publishing; theatre; set design; television; industry and business; communication; management and research in the creative and academic areas. A major in art also provides students with a broad humanistic background appropriate to preparation for advanced degrees in other fields.

### Graduate Program Information

The Department of Art offers Master of Arts in Art with an emphasis in Art History and Master of Fine Arts Degrees. At the graduate level students focus on an individualized program of study, supported by required coursework and mentorship with the graduate faculty. Master of Arts in Art History students can concentrate on the periods from the Medieval to Contemporary including non-western studies in the arts of the Americas

and China. Master of Fine Art students are encouraged to work across disciplines and cultivate their personal research with the broad context of 21st-century art and art history. The department supports work in and across the following areas: ceramics, graphic design, jewelry and metalsmithing, painting and drawing, photography, printmaking and sculpture.

## Degrees for the Department

Art - Bachelor of Arts (p. 205)

Art - Bachelor of Fine Arts (p. 206)

Art - Master of Arts (p. 208)

Art - Master of Fine Arts (p. 208)

## Minors for the Department

Art - Undergraduate Minor (p. 207)

Art History - Undergraduate Minor (p. 207)

Museum Conservation - Undergraduate Minor (p. 207)

**Professor, Julia Barello, Department Head**

**Professors** Barello, Stevens; **Associate Professors** Cully, Goehring, Zarur; **Assistant Professors** d'Agostino, Edgar, Furuhashi; **College Instructors** Cole-Dorn, Fitzsimmons, Marinas-Feliner; **Gallery Director** Sage; **Conservator** Marinas-Feliner

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## Art Courses

### ART 101G. Orientation in Art

**3 Credits (2+3P)**

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.

### ART 110G. Visual Concepts

**3 Credits (2+4P)**

Introduction to the philosophies of art, visual thinking, and principles of visual organization. Designed to give students a broad view of aesthetic traditions, ideologies, and techniques basic to the creation and evaluation of art. Principles and concepts are taught in a common lecture and applied in parallel small studio sections. For non-art majors only.

### ART 150. Drawing I

**3 Credits (2+4P)**

Introduction to the skill of seeing through exercises that emphasize careful drawing from the still life and utilize a range of drawing materials and techniques. Outside assignments required. Intended for non-art majors on main campus. May be repeated up to 3 credits.

### ART 151. Drawing II

**3 Credits (2+4P)**

Continued emphasis on drawing from observation by focusing on still life and other subject matter. Covers a range of materials, techniques and concepts. Outside assignments. Restricted to ART and ANVE/DFM majors.

**Prerequisite(s):** ART 150.

### ART 155. 2-D Fundamentals

**3 Credits**

Introduction to two-dimensional space emphasizing visual elements and design principles as they apply to composition. A variety of materials are used in the studio projects and sketchbook exercises. Developing knowledge in vocabulary, color theory and skill in translating ideas into design are encouraged. Restricted to Community Colleges campuses only.

### ART 156. 3-D Fundamentals

**3 Credits**

Compositional organization of three-dimensional space explored through a broad range of visual exercises. Resourceful and creative problem solving encouraged. Restricted to Community Colleges campuses only.

### ART 157. Color Theory

**3 Credits (2+4P)**

Various color theories as they relate to compositional organization. Required for art education majors.

### ART 160. Computer-Based Illustration

**3 Credits (2+4P)**

Introduction to the principles of computerized drawing and design. Using the basic concepts, drawing tools, and vocabulary of Adobe Illustrator.

**Prerequisite:** ART 150, ART 155, or consent of instructor.

### ART 161. Digital Imaging I

**3 Credits (2+4P)**

Work with basic concepts, tools, and vocabulary of Adobe Photoshop to create effective visual communication. Includes selection tools, cloning, copying and pasting, color correction, image restoration, filters, and special effects. Community Colleges only.

### ART 163. Digital Graphics

**3 Credits (2+4P)**

Importing and exporting images and text into various desktop publishing formats. Exploring imaging, drawing, and page layout applications.

Introduction to typography.

**Prerequisite:** ART 161.

### ART 165. Web Page Design

**3 Credits (2+4P)**

Introduction to the creation of well-designed and organized Web sites. Emphasis on building creative but functional user-friendly sites. Introduction to HTML, Flash, Java Script, and Web-authoring software. Community Colleges only. Same as OEPT 165.

**Prerequisite:** ART 161.

### ART 250. Introduction to Drawing

**3 Credits (2+4P)**

Introduction to drawing with a focus on technical, structural, and methodological skills. Subjects include still life and live figure models.

### ART 252. Aspects of Drawing

**2-3 Credits**

Continued work in drawing with emphasis on personal creative endeavor. Community Colleges only.

**Prerequisites:** ART 150, ART 151, and ART 250.

**ART 255. Introduction to Graphic Design****3 Credits (2+4P)**

Introduction to the principles of visual communication and digital media, letterforms, typography and identity marks. Projects produced using conventional and digital tools.

**ART 260. Introduction to Painting****3 Credits (2+4P)**

Introduction to basic skills of painting through various exercises that emphasize working from observation, images and imagination. May be repeated up to 3 credits.

**Prerequisite(s):** ART 250 or ART 150.

**ART 261. Painting Methods, Techniques and Applications****3 Credits (2+4P)**

The investigation of formal aspects of painting, an examination of painting techniques, and an exploration of various methodologies regarding form and content as applied to critical thinking skills through medium of paint.

**Prerequisite(s):** ART 150, ART 260.

**ART 262. Aspects of Painting****2-3 Credits**

Varied painting media: continued development of painting skills.

**Prerequisites:** ART 150, ART 155 (for art majors), ART 260, or consent of instructor.

**ART 265. Introduction to Sculpture****3 Credits (2+4P)**

Beginning sculpture students “explore space” while learning new processes and skills, including mold making, welding and woodworking.

**ART 267. Art Portfolio Preparation****3 Credits (2+4P)**

Refine general marketing strategies, personal portfolio and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional packages.

**Prerequisites:** ART 163, ART 269, and ART 272, or consent of instructor.

**ART 269. Advanced Computer-Based Illustration****3 Credits (2+4P)**

Design custom graphics and create special effects with filtering, special effects on type, graphing, technical illustrations, and three-dimensional drawing using Adobe Illustrator.

**Prerequisites:** ART 157, ART 160, and ART 161, or consent of instructor.

**ART 270. Introduction to Photography****3 Credits (2+4P)**

Introduction to the production of digital images within the context of contemporary art. Utilizes digital SLR cameras with an emphasis on basic camera operation, picture composition, image processing and digital workflow. A DSLR camera is required. May be repeated up to 3 credits.

**ART 272. Digital Imaging II****3 Credits (2+4P)**

Refining of individual creative styles and technical skills using Adobe Photoshop. Emphasis on input and output predictability, and working with large file productions. Community colleges only. Restricted to: Community Colleges only.

**Prerequisite(s):** ART 161.

**ART 275. Introduction to Ceramics****3 Credits (2+4P)**

Introduction to the technical processes and conceptual concerns of working with the ceramic material. Students will explore various methods of forming with earthenware to make both functional and expressive works out of clay.

**ART 276. Ceramics I, B****3 Credits (2+4P)**

Beginning ceramics, complementary half to ART 275. (ART 275 and ART 276 do not need to be taken consecutively.) Basic building techniques of coil, slab, and throwing are introduced. High-fire and low-fire clays are used.

**ART 280. Introduction to Printmaking****3 Credits (2+4P)**

Introduction to the field of printmaking through projects that focus on specific processes, such as relief, intaglio, collography, paper lithography, and a variety of transfer and stencil techniques. Students engage in several assignments that are collaborative, as well as individual projects designed for development of personal aesthetics.

**ART 285. Introduction to Metals and Jewelry****3 Credits (2+4P)**

Introduction to fundamental processes, design, and conceptual development for metal fabrication of jewelry and functional/non-functional objects.

**ART 286. Stained Glass****3 Credits (2+4P)**

Instruction in the fundamental fabrication and design techniques for stained glass. Introduction to visual decision making skills, historical, and critical issues of the medium. Community Colleges only.

**ART 294. Special Topics in Studio****1-3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.

**Prerequisite:** consent of instructor.

**ART 295G. Introduction to Art History I****3 Credits**

An introduction to the principles of art history within a chronological framework of the art of the Western World. All media will be discussed. From prehistoric times to the fourteenth century.

**ART 296G. Introduction to Art History II****3 Credits**

Continuation of ART 295, Art of the Western World from Late Gothic to the present. May be repeated up to 3 credits.

**ART 298. Writing in Art****3 Credits**

This reading- and writing-intensive course will introduce students to various approaches of writing about historical art.

**ART 300. Special Topics in Art History****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 305. Medieval Art****3 Credits**

History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ART 505.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 306. Medieval Manuscript Illumination****3 Credits**

History of manuscript production and illumination in Western Europe from the Early Christian period to the middle of the 16th century; taught with ART 506.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 310. Native American Art****3 Credits**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. Considers the artistic expression and the function of art in diverse cultural and environmental contexts.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of the instructor.

**ART 311. Art of China I: Neolithic to Song Dynasty****3 Credits**

Survey of the art of China from the neolithic period to the end of the Song dynasty. Non-majors welcome. May be repeated up to 3 credits. Crosslisted with: ART 511.

**Prerequisite(s):** ART 295G, 296G, and 298 or HIST 211G and HIST 212G or consent of instructor.

**ART 320. Art and Architecture in Pre-Columbian Meso-America****3 Credits**

Analysis of the art and culture of the Mesoamerican peoples before the arrival of Columbus in the New World. Includes an in-depth formal and historical analysis of architecture, sculpture, painting, pottery, and metal works of Mixtec, Toltec, Aztec, Maya, and other cultures and civilizations.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 321. Pre-Columbian Art and Architecture of the Andes****3 Credits**

Examines the arts and history of pre-Columbian Andean cultures in a cultural context. Analysis of architecture, sculpture, pottery, jewelry, textiles, and feather work.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 323. Italian Renaissance Art****3 Credits**

History of painting, sculpture and architecture in Italy from the 14th century to the end of the 16th century; taught with ART 523.

**Prerequisite(s):** ART 295G, ART 296G and ART 298 or consent of instructor.

**ART 325. Northern Renaissance Art****3 Credits**

History of painting, manuscript illumination and graphics in Northern Europe from the late 14th century to the mid-16th century; taught with ART 525.

**Prerequisite(s):** ART 295G, 296G, and 298 or consent of instructor.

**ART 328. Baroque Art and Architecture in Northern Europe****3 Credits**

Study of architecture, painting sculpture in Flanders, Holland, France, England, and Germany as indigenous developments and as reflections of the Italian Baroque.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 329. Survey of Western Architecture****3 Credits**

Survey of history of Western architecture from prehistoric time to the present.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 330. Modern Architecture****3 Credits**

A survey of the history of Modern Architecture with focus given to major architects, monumental buildings, and building groups stressing construction techniques and style from the 18th century to the present.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 333. Baroque Art and Architecture in Italy, Spain, and Hispanic Latin America****3 Credits**

Concentration of Italian Baroque architecture, painting, and sculpture; and on Spanish painting, sculpture, and architecture, as well as the art and architecture of Spanish vice-royalties of the Americas.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 337. American Art to 1900****3 Credits**

Examines painting, sculpture, architecture and other arts in the United States from the colonial period to 1900 and places them within conceptual and historical contexts. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 338. Late Eighteenth- and Nineteenth-Century European Art****3 Credits**

History of painting, sculpture, architecture, and other arts created in Europe from 1789 to 1900. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 339. History of Photography****3 Credits**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 342. Twentieth-Century Art I, 1900-1945****3 Credits**

Examines themes and monuments of the Western world created between 1900 and 1945 and emphasizes the growth of modern and avant garde cultural practices.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 343. Twentieth-Century Art II, 1945-Present****3 Credits**

History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1945 to the present.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 350. Intermediate Drawing and Painting****3 Credits (2+4P)**

Intermediate drawing and painting course focusing on the following topics: Realism, Color, Narrative, and Abstraction. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

**Prerequisite(s):** ART 250 and ART 260, or consent of instructor.

**ART 354. History of Graphic Design****3 Credits**

This course introduces students to the history of graphic design and evolution of visual communication. Course will involve writing and design projects.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 355. Special Topics in Graphic Design****3 Credits (2+4P)**

Intermediate graphic design course focusing on the following topics: production, packaging, layout, identity and interactive design. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

**Prerequisite(s):** ART 255 or consent of instructor.

**ART 360. The Figure****3 Credits (2+4P)**

Introduction to working from live models, anatomical skeletons, source images and the imagination in a variety of two-dimensional media, including painting and drawing. An emphasis is placed on anatomical accuracy and with a focus on the figure as an expressive subject. May be repeated up to 6 credits.

**Prerequisite(s):** ART 150, 250 or consent of instructor.

**ART 365. Intermediate Sculpture Special Topics****3 Credits (2+4P)**

Intermediate sculpture students will expand their fabrication skills in metal, wood and mixed media. Assignments incorporate topics such as Pop art, Process Art, and The Body in Contemporary Art. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 6 credits.

**Prerequisite(s):** ART 265 or consent of instructor.

**ART 370. Intermediate Digital Photography****3 Credits (2+4P)**

Intermediate digital photography course addressing techniques and production of photo media within the context of contemporary art. Course focuses on the following rotating topics: Networks, Photo-book and Video art. May be repeated up to 12 credits.

**Prerequisite(s):** ART 270, or consent of instructor.

**ART 373. Intermediate Analog Photography****3 Credits (2+4P)**

Introduction to skills and techniques of black and white film photography within the context of contemporary art. Emphasis on analog camera work and darkroom procedures. 35 mm SLR or rangefinder film camera required for course. May be repeated up to 6 credits.

**Prerequisite(s):** ART 270, or consent of instructor.

**ART 374. Intermediate Ceramics: Multiples (Design and Production)****3 Credits (2+4P)**

Intermediate ceramics course focusing on an introduction to the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. May be repeated up to 3 credits.

**Prerequisite(s):** ART 275 or consent of instructor.

**ART 375. Intermediate Ceramics: Sculptural Concerns****3 Credits (2+4P)**

Intermediate ceramics course focusing on the refinement of technical skills with an emphasis on conceptual development related to materiality.

**Prerequisite(s):** ART 275 or consent of instructor.

**ART 376. Museum/Gallery Research Internship****1-9 Credits**

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 380. Intermediate Printmaking****3 Credits (2+4P)**

Intermediate printmaking course with emphasis on further investigation of a variety of materials and techniques associated with the print processes of intaglio and relief. Stone lithography, serigraphy and mixed media will be introduced. May be repeated up to 6 credits.

**Prerequisite(s):** ART 280, or consent of instructor.

**ART 385. Intermediate Metals: Special Topics****3 Credits (2+4P)**

Intermediate Metals/Jewelry course focusing on the following topics: design and production, materiality and sculptural concern. Techniques may include casting, complex construction, forming, and mix media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 6 credits.

**Prerequisite(s):** ART 285 or consent of instructor.

**ART 390. Visual Culture of the 1960s****3 Credits**

Focus on major cultural trends and historical events in 1960's America. Offers analysis of art, films, and pop culture phenomena of the period.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 392. Visual Culture of the 1980s****3 Credits**

Focus on major cultural trends and historical events in 1980's America. Offers analysis of art, films, and pop culture phenomena of the period.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 394. Special Topics in Studio****3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes online. Topics cannot be repeated. May be repeated up to 9 credits.

**ART 401. Museum Conservation Techniques I****3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. Crosslisted with: ART 501.

**ART 402. Museum Conservation Techniques II****3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ART 502.

**Prerequisite(s):** ART 401.

**ART 403. Preventative Conservation/Collections Care****3 Credits**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ART 503.

**ART 444. Art and Life in Renaissance Italy****3 Credits**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself. 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, titian, humanism, the Medici, and republican and courtly culture.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 450. Advanced Drawing and Painting: Special Topics****3-6 Credits (2-4+4P)**

Advanced drawing and painting course focusing on the following topics: Identity, Place, Spirituality, and Body. Topics will be announced in the course schedule. May be repeated up to 12 credits.

**Prerequisite(s):** 12 credits of ART 350, or consent of instructor.

**ART 455. Advanced Graphic Design Special Topics****3-6 Credits (3-6)**

Advanced graphic design course focusing on the following topics: visual communication, system graphics, typography, portfolio preparation, art of the book and professional practice. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 15 credits.

**Prerequisite(s):** 6 credits of ART 355, or consent of instructor.

**ART 465. Advanced Sculpture Special Topics****3-6 Credits (2-4+4P)**

Thematic classes deepen students' knowledge of contemporary sculpture and extended media through a series of interpretive assignments that culminates in a unified body of work. Course topics include: "Artists' Maps", Installation Art/Land Art", "Sculpture and the 1960s", "Sculpture and the 1970's". Topics will be announced in the course schedule. May be repeated up to 18 credits.

**Prerequisite(s):** ART 365 or permission of the instructor.

**ART 470. Advanced Digital Photography****3 Credits (2+4P)**

Advanced digital photography course addressing technique and production of photo media within the context of contemporary art. Course focuses on the following rotating topics: Temporality, Photo-installation and Video Art. Each topic may only be taken once. May be repeated up to 12 credits.

**Prerequisite(s):** ART 370 or consent of instructor.

**ART 473. Advanced Analog Photography****3 Credits (2+4P)**

Advanced photography course focused on skills and techniques of black and white film within the context of contemporary art. Course focuses on the following rotating topics: Large Format Tableau, Experimental Processes and Materials. May be repeated up to 12 credits.

**Prerequisite(s):** ART 370 and ART 373, or consent of instructor.

**ART 474. Advanced Ceramics Design and Production****3-6 Credits (3-6)**

Advanced ceramics course focusing on the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. Discussions may also include issues of professional practice, marketing, and branding. May be repeated up to 6 credits.

**Prerequisite(s):** ART 374 and ART 375, or consent of instructor.

**ART 475. Advanced Ceramics Sculptural Concerns****3-6 Credits (2-4+4P)**

Advanced ceramics course focusing on conceptual development as it relates the creation of a unified body of work. Topics may include discussions of advanced techniques, professional practices, and contemporary issues in ceramics. May be repeated up to 15 credits.

**Prerequisite(s):** ART 374 and ART 375, or consent of instructor.

**ART 476. Advanced Museum/Gallery Research Internship****1-9 Credits**

Advanced research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** ART 376.

**ART 477. Independent Research Problems in Art History****1-9 Credits**

Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required.

**Prerequisite(s):** ART 295G, ART 296G, ART 298 and one 300 level art history course and consent of instructor.

**ART 478. Seminar: Selected Topics in Art History****3 Credits**

Reading, research, and discussion of advanced problems. Topics will be announced in the course schedule. Each topic may be only taken once. Non-art/art history majors, contact instructor for consent. May be repeated up to 12 credits.

**Prerequisite(s):** ART 295G, ART 296G and ART 298, and one 300 level art history course.

**ART 479. Art Theory, Criticism, and Historiography****3 Credits**

Theories and methodologies in art history and art criticism. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298 and one 300 level art history course and consent of instructor.

**ART 480. Special Topics in Printmaking****3-6 Credits (3-6)**

Special topics in printmaking. Emphasizing conceptual approaches to printmaking and development of individual content. Topics will be announced in the course schedule. May be repeated up to 18 credits.

**Prerequisite(s):** 6 credits of ART 380, or consent of instructor.

**ART 485. Advanced Metals: Special Topics****3-6 Credits (2-4+4P)**

Advanced Metals/Jewelry course focusing on the following topics: conceptual development and personal aesthetic and style, professional practices, contemporary issues in Metals/Jewelry, and senior exhibition. Techniques may include enameling, coloring, historical processes, and digital technology. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 18 credits.

**Prerequisite(s):** 6 credits of ART 385, or consent of instructor.

**ART 490. Museum Conservation Internship****1-6 Credits (1-6)**

The goal of this internship is to provide a student with a practical learning experience in preventative conservation techniques and policies so that they can relate what they have learned in the classroom from ART 403 Preventative Conservation/Collections Care to applied situations. It will provide the student an opportunity to learn skills and knowledge needing in working with museum collections. Tasks and projects will be assigned by the instructor. 3 credits required for BFA in Museum Conservation.

May be repeated up to 6 credits.

**Prerequisite(s):** ART 403.

**ART 494. Special Topics in Studio****3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes online. May be repeated up to 9 credits.

**ART 495. Undergraduate Studio Thesis****3-6 Credits (3-6)**

Special research and independent study leading to undergraduate thesis exhibition. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ART 496. Fundamentals of Studio Management****1 Credit**

Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.

**Prerequisite:** consent of instructor.

**ART 497. Readings in Art History****3 Credits**

In-depth study of art historical writing. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** ART 295G, ART 296G, ART 298 and one 300 level art history course.

**ART 499. Problems in Studio Art****1-6 Credits (1-6)**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 9 credits. Consent of Instructor required.

**ART 500. Special Topics in Art History****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

**Prerequisite(s):** Graduate status.

**ART 501. Museum Conservation Techniques I****3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. May be repeated up to 3 credits. Crosslisted with: ART 401.

**ART 502. Museum Conservation Techniques II****3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ART 402.

**Prerequisite(s):** ART 501.

**ART 503. Preventive Conservation/Collections Care****3 Credits**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ART 403.

**ART 505. Medieval Art****3 Credits**

History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ART 305.

**Prerequisite(s):** Graduate Standing.

**ART 506. Medieval Manuscript Illumination****3 Credits**

History of manuscript production and illumination in Western Europe from the Early Christian period to the middle of the 16th century; taught with ART 306. Consent of instructor required.

**Prerequisite(s):** ART 295G and ART 305 or ART 505.

**ART 510. Advanced Native American Art****3 Credits**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. The artistic expression and the function of art considered in diverse cultural and environmental contexts. Crosslisted with: ART 310.

**Prerequisite(s):** Graduate standing.

**ART 511. Art of China I: Neolithic to Song Dynasty****3 Credits**

Survey of the art of China from the neolithic period to the end of the Song dynasty. May be repeated up to 3 credits. Crosslisted with: ART 311.

**Prerequisite(s):** Graduate Standing.

**ART 520. Art and Architecture in Pre-Columbian Mesoamerica****3 Credits**

Analysis of the art and culture of the Mesoamerican peoples before the arrival of Columbus in the New World. Includes an in-depth formal and historical analysis of architecture, sculpture, painting, pottery and metal works of Mixtec, Toltec, the Aztec, Maya, and other cultures and civilizations. Crosslisted with: ART 320.

**Prerequisite(s):** Graduate standing.

**ART 521. Pre-Columbian Art and Architecture of the Andes****3 Credits**

Examines the arts and history of pre-Columbian Andean cultures in a cultural context. Analysis of their architecture, sculpture, pottery, jewelry, textiles, and featherwork. Crosslisted with: ART 321.

**Prerequisite(s):** Graduate standing.

**ART 523. Italian Renaissance Art****3 Credits**

History of painting, sculpture and architecture in Italy from the 14th century to the end of the 16th century; taught with ART 323.

**Prerequisite(s):** Graduate standing.

**ART 525. Northern Renaissance Art****3 Credits**

History of painting, manuscript illumination and graphics in Northern Europe from the late 14th century to the mid-16th century; taught with ART 325.

**Prerequisite(s):** Graduate standing.

**ART 530. Modern Architecture****3 Credits**

Study of the architecture of the later eighteenth, nineteenth and twentieth centuries in the context of technological, social and stylistic changes. Focus on the works of Louis Sullivan, Frank Lloyd Wright, and European architects of the International Style, and the current reaction. Crosslisted with: ART 330.

**Prerequisite(s):** Graduate standing.

**ART 533. Baroque Art and Architecture in Italy, Spain, and Hispanic Latin America****3 Credits**

Concentration on Italian and Spanish Baroque architecture, painting, and sculpture, as well as the art and architecture of Spanish vice-royalties of the Americas. Crosslisted with: ART 333.

**Prerequisite(s):** Graduate standing.

**ART 537. American Art to 1900****3 Credits**

Covers the history of painting, sculpture, architecture, and other arts in the United States from the colonial period to 1900. Crosslisted with: ART 337.

**Prerequisite(s):** Graduate standing.

**ART 538. Late Eighteenth- and Nineteenth-Century European Art****3 Credits**

History of painting, sculpture, architecture, and other arts created in Europe from 1789 to 1900. May be repeated up to 3 credits. Crosslisted with: ART 338.

**Prerequisite(s):** Graduate standing.

**ART 539. History of Photography****3 Credits**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. Crosslisted with: ART 339.

**Prerequisite(s):** Graduate standing.

**ART 542. Twentieth-Century Art I, 1900-1945****3 Credits**

History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1900 to 1945. Crosslisted with: ART 342.

**Prerequisite(s):** Graduate standing.

**ART 543. Twentieth-Century Art II, 1945-Present****3 Credits**

History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1945 to the present. Comprehensive research paper required. Crosslisted with: ART 343.

**Prerequisite(s):** Graduate standing.

**ART 550. Drawing and Painting Workshop****3-6 Credits (2-4+4P)**

Graduate level drawing and painting course focusing on the development of concepts, expression and visual form. May be repeated up to 27 credits.

**Prerequisite(s):** Graduate standing.

**ART 555. Graphic Design****3 Credits**

May be repeated up to 27 credits.

**ART 560. Painting Workshop****3-9 Credits**

Advanced work with painting skills. Emphasis on critical analysis and development of body of work. May be repeated up to 27 credits.

**Prerequisite(s):** Graduate standing.

**ART 565. Sculpture Media****3-9 Credits**

May be repeated up to 27 credits.

**ART 570. Advanced Introduction to Photography****3-9 Credits**

Graduate students develop and implement a research program using photographic media and processes. Outcomes and program developed in consultation with photography faculty. May be repeated up to 30 credits.

**Prerequisite(s):** .

**ART 573. Non-Silver Photographic Processes****3 Credits**

Advanced work with historic photographic processes. Emphasis on creation of an extended body of work. Taught with ART 373. Consent of instructor required. Restricted to ART majors.

**Prerequisite(s):** ART 270, ART 271, ART 274.

**ART 575. Ceramic Arts****3-9 Credits**

May be repeated up to 27 credits.

**ART 576. Museum/Gallery Research Internship****1-9 Credits**

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. May be repeated for a maximum of 9 credits.

**Prerequisite:** graduate standing.

**ART 578. Seminar: Selected Topics in Art History****3 Credits**

Reading, research, and discussion of advanced problems. May be repeated for a maximum of 9 credits.

**Prerequisite:** graduate standing.

**ART 579. Graduate Seminar: Art Theory, Criticism, Historiography**  
**3 Credits**

Theories and methodologies in art history and art criticism.

**Prerequisite:** graduate standing.

**ART 580. Printmaking Workshop**  
**3-6 Credits**

May be repeated for a maximum of 33 credits.

**Prerequisite(s):** Graduate standing.

**ART 585. Metals and Jewelry Design**  
**3-9 Credits**

May be repeated up to 27 credits.

**ART 590. Visual Culture of the 1960s**  
**3 Credits**

Focuses on major cultural trends and historical events in 1960s America. Offers analysis of art, films, and pop culture phenomena of the period.

Fulfill all requirements of ART 390 plus graduate-level research.

**Prerequisite(s):** Graduate standing.

**ART 591. Visual Culture of the 1970s**  
**3 Credits**

Focuses on major cultural trends and historical events in 1970s America. Offers analysis of art, films, and pop culture phenomena of the period.

Fulfill all requirements of ART 391 plus graduate-level research.

**Prerequisite(s):** Graduate standing.

**ART 592. Visual Culture of the 1980s**  
**3 Credits**

Focuses on major cultural trends and historical events in 1980s America. Offers analysis of art, films, and pop culture phenomena of the period.

Fulfill all requirements of ART 392 plus graduate-level research.

**Prerequisite(s):** Graduate standing.

**ART 595. Problems in Studio**  
**1-6 Credits**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 12 credits. Consent of Instructor required.

**ART 596. Graduate Studio Seminar**  
**3 Credits**

Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form. May be repeated for a maximum of 18 credits. Restricted to majors.

**Prerequisite(s):** Graduate standing.

**ART 597. Readings in Art History**  
**3 Credits**

In-depth study of historical writing about art. May be repeated for a maximum of 9 credits.

**Prerequisite:** graduate standing.

**ART 598. Studio Thesis**  
**1-15 Credits**

Special research in studio, leading to an exhibition and written thesis statement.

**ART 599. Art History Thesis**  
**1-15 Credits**

Art history master's thesis research. May be repeated for unlimited credit. Restricted to masters level art history students. Consent of instructor required.

**Prerequisite(s):** Graduate standing.

**Name:** Julia Barello, Department Head

**Office Location:** D.W. Williams Hall, Room 100

**Phone:** (575) 646-1705

**Website:** <http://artdepartment.nmsu.edu/>

**UAG Gallery Website:** <http://uag.nmsu.edu>

## Art - Bachelor of Arts

### Concentration: Art History

The art history program is designed to give the student a broad familiarity with the visual arts through the factual and theoretical study of aesthetics, cultural contexts, iconography, pictorial traditions, stylistic development and technical practices. Students are encouraged to take related courses in anthropology, history, languages and literature, music history, philosophy, religion, theatre and costume history.

### Second Language Requirement

For the Bachelor of Arts- Art with a concentration in Art History there is a two year second language requirement for the degree. Students must demonstrate a reading knowledge of a second language either by completing the 212 or 214 course or by taking a 300-level literature course (FREN, GER, SPAN, PORT, JPNS or CHIN). **Art History majors may not use C D 476 American Sign Language III to fulfill the language requirement.**

### Departmental Requirements

Course	Title	Credits
<b>Freshman</b>		
ART 150	Drawing I	3
ART 295G	Introduction to Art History I	3
ART 298	Writing in Art	3
Introductory Studio Art 200-level courses		3
Credits		12
<b>Sophomore</b>		
ART 296G	Introduction to Art History II	3
Art History Courses (300 level)		6
Studio Art Courses 200-400 level or Art History Courses 300-400 level		3
Credits		12
<b>Junior</b>		
Art History Courses (300-400 level)		9
Studio Art Courses 200-400 level or Art History Courses 300-400 level		3
Credits		12
<b>Senior</b>		
ART 479	Art Theory, Criticism, and Historiography	3
Art History Courses (300-400) level		6
Studio Art Courses 200-400 level or Art History Courses 300-400 level		3
Credits		12
Total Credits		48

### Electives

Sufficient to bring total credits to 120 for graduation, including 48 upper-division.

## Concentration: Studio Art

The Bachelor of Arts is designed to give the student a broad interdisciplinary understanding of the areas of painting/drawing, graphic design, printmaking, sculpture, photography, ceramics, conservation, jewelry and metalsmithing, through a series of introductory and special topics courses and the history and appreciation of art in the context of a liberal education. Students are required to take 30 credits of upper-level studio art classes and 18 credits of Art History.

### Second Language Requirement

For the Bachelor of Arts- Art with a concentration in Studio Art there is no second language requirement for the degree.

### Departmental Requirements

Course	Title	Credits
<b>Freshman</b>		
ART 295G	Introduction to Art History I	3
ART 298	Writing in Art	3
Introductory Studio Art Courses 200-level		12
Credits		18
<b>Sophomore</b>		
ART 296G	Introduction to Art History II	3
Introductory Studio Art 200-level courses		6
Special Topic Art Courses (300 level)		6
Art History (300 level)		3
Credits		18
<b>Junior</b>		
Special Topic Art Courses (300 level)		12
Art History (300/400 level)		3
Credits		15
<b>Senior</b>		
Special Topic Art Courses 400-level		12
Art History (300/400 level)		3
Credits		15
Total Credits		66

## Art - Bachelor of Fine Arts

### Concentration: Museum Conservation

Art Conservation is the study of the preservation and restoration of art as well as of other cultural and natural objects. The B.F.A. degree with an concentration in Museum Conservation provides an academic structure within which students master specific sets of practical skills while developing broad professional and theoretical perspectives toward the issue of conserving objects in a museum or collection setting. By combining theory with practice, the program offers students the interpretive, quantitative and administrative skills needed for careers as conservators, curators, registrars, collections managers, exhibit designers and museum administrators, all of whom must have specialized training in the care and handling of works of art to be successful.

#### Science

Select 16 credits from Option A or Option B:	16
<i>Option A</i> <sup>1</sup>	
CHEM 313	Organic Chemistry I

CHEM 314	Organic Chemistry II	
CHEM 315	Organic Chemistry Laboratory	
Select one from the following:		
CHEM 111G & CHEM 112G	General Chemistry I and General Chemistry II	
CHEM 115 & CHEM 116	Principles of Chemistry I and Principles of Chemistry II	
<i>Option B</i> <sup>2</sup>		
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
or EPWS 303	Economic Entomology	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
CHEM 211	Organic Chemistry	
<b>Art History</b>		
ART 295G	Introduction to Art History I	3
ART 296G	Introduction to Art History II	3
ART 298	Writing in Art	3
ART history electives 300 level or higher		9
<b>History/Anthropology</b>		
ANTH 315	Introduction to Archaeology	3
Select one from the following:		3
HIST 330V	Introduction to Religious Studies	
HIST 334	Art and Life in Renaissance Italy	
HIST 371	Ancient Greece	
HIST 397	Introduction to Public History	
HIST 424	History of Art, Thought and Literature	
HIST 438	Antiquity and Modernity	
HIST 481	Time Traveling Through New Mexico's Past	
HIST 483	Historic Preservation	
HIST 486	Interpreting Historic Places for the Public	
HIST 486	Interpreting Historic Places for the Public	
Select 9 credits from the following:		9
ANTH 313	Ancient Mexico	
ANTH 316	Archaeology of the American Southwest	
ANTH 318	Historical Archaeology in Latin America	
ANTH 378	Introduction to Lab Methods in Archaeology (offered intermittently)	
ANTH 467	Archaeology of the American Southwest	
ANTH 485	Special Research Project	
ANTH 497	Special Topics	
<b>Museum Studies</b>		
ANTH 345	Introduction to Museology	3
ART 490	Museum Conservation Internship	3
<b>Studio Art</b>		
ART 250	Introduction to Drawing	3
ART 260	Introduction to Painting	3
Studio Art Courses (200-400 level)		9
<b>Art Conservation</b>		
ART 401	Museum Conservation Techniques I <sup>3</sup>	3
ART 402	Museum Conservation Techniques II <sup>3</sup>	3

ART 403	Preventative Conservation/Collections Care <sup>3</sup>	3
ART 499	Problems in Studio Art (recommended)	1-6
<b>Second Language Requirement: (not required)</b>		
Total Credits		80-85

<sup>1</sup> Recommended for students planning to attend graduate school in art conservation.

<sup>2</sup> Recommended for students who do NOT plan to attend graduate school in art conservation.

<sup>3</sup> Courses are open by permission of the instructor only.

## Second Language Requirement

For the Bachelor of Arts- Art with a concentration in Museum Conservation there is no second language requirement for the degree.

## Emphasis: Studio Art

The studio art curriculum is designed to give the student a broad, transdisciplinary understanding of the field of visual arts, including appreciation and criticism, art history, ceramics, drawing, graphic design and media arts, jewelry/metalsmithing, painting, photography, printmaking, sculpture and museum conservation. This program is recommended for those students who wish to embark on a professional career in art. The maximum number of credits counted toward graduation is 84. The maximum credits for variable courses shall be 6 credits per semester except by permission. The Bachelor of Fine Arts degree is a professional baccalaureate degree, which requires a senior thesis exhibition and capstone class in the final semester of study. Students seeking a BFA must apply in the spring of their sophomore year for acceptance into the BFA program - this is done via a portfolio review.

Course	Title	Credits
<b>Freshman</b>		
ART 295G	Introduction to Art History I	3
ART 298	Writing in Art	3
Introductory Studio Art 200-level courses		12
Credits		18
<b>Sophomore</b>		
Submit application to BFA Program (students may reapply as many times as necessary).		
ART 296G	Introduction to Art History II	3
Introductory Studio Art 200-level courses		6
Special Topic Art Courses (300 level)		6
Art History (300 level)		3
Credits		18
<b>Junior</b>		
Special Topic Art Courses (300 level)		12
Special Topic Art Courses (400-level)		6
Art History Courses (300-400) level		6
Credits		24
<b>Senior</b>		
Special Topic Art Courses (400-level)		15
Art History (300/400 level)		3
ART 495	Undergraduate Studio Thesis	3-6
<b>Thesis Exhibition/Capstone Course</b>		

BFA students must have a thesis exhibition at the culmination of their degree.

Credits	21-24
Total Credits	81-84

## Second Language Requirement

For the Bachelor of Arts- Art with a emphasis in Studio Art there is no second language requirement for the degree.

## Art - Undergraduate Minor

The Art minor requires 27 credits. Students cannot earn both a bachelor's degree in the Department of Art and a Art minor unless they pass at least 6 credits in the minor beyond the requirements of the major.

### Required Courses

Studio art or art history at the 300-400 level	9
Select six from the following:	18
ART 250	Introduction to Drawing
ART 255	Introduction to Graphic Design
ART 260	Introduction to Painting
ART 265	Introduction to Sculpture
ART 270	Introduction to Photography
ART 275	Introduction to Ceramics
ART 280	Introduction to Printmaking
ART 285	Introduction to Metals and Jewelry
ART 295G	Introduction to Art History I
ART 296G	Introduction to Art History II
ART 298	Writing in Art
Total Credits	27

## Art History - Undergraduate Minor

The Art History minor requires 27 credits. Students cannot earn both a bachelor's degree in the Department of Art and an Art History minor unless they pass at least 6 credits in the minor beyond the requirements of the major. Students cannot earn both the Bachelor of Art with an Art History emphasis and a minor in Art History.

### Required Courses

ART 295G	Introduction to Art History I	3
ART 296G	Introduction to Art History II	3
ART 298	Writing in Art	3
Art history courses at the 300-499 level		15
Humanities or studio art, subject to approval by the minor advisor		3
Total Credits		27

## Museum Conservation - Undergraduate Minor

The Museum Conservation minor requires 18 credits. Students cannot earn both a bachelor's degree in the Department of Art and the Museum Conservation minor unless they pass at least 6 credits in the minor beyond the requirements of the major. An undergraduate minor in Museum conservation requires the completion of 9 credits of the three

400 level museum conservation listed below, and 9 credits of the courses selected from one of the three tracks listed below.

#### Required Courses

ART 401	Museum Conservation Techniques I (Spring)	3
ART 402	Museum Conservation Techniques II (Fall)	3
ART 403	Preventative Conservation/Collections Care (Directed Readings)	3
Select one from the following tracks:		9
Anthropology		
Art		
History		
Total Credits		18

### Track 1: Anthropology

Select 9 credits from the following: 9

ANTH 313	Ancient Mexico (offered every fall)	
ANTH 315	Introduction to Archaeology	
ANTH 316	Archaeology of the American Southwest	
ANTH 318	Historical Archaeology in Latin America	
ANTH 378	Introduction to Lab Methods in Archaeology (offered intermittently)	
ANTH 485	Special Research Project	
Total Credits		9

### Track 2: Art

Select 9 credits from the following: 9

ART 150	Drawing I	
ART 250	Introduction to Drawing	
ART 260	Introduction to Painting	
ART 265	Introduction to Sculpture	
ART 270	Introduction to Photography	
ART 275	Introduction to Ceramics	
ART 280	Introduction to Printmaking	
ART 285	Introduction to Metals and Jewelry	
ART 295G	Introduction to Art History I	
ART 296G	Introduction to Art History II	
ART 298	Writing in Art	
Total Credits		9

### Track 3: History

Select 9 credits from the following: 9

HIST 330V	Introduction to Religious Studies	
HIST 334	Art and Life in Renaissance Italy	
HIST 371	Ancient Greece	
HIST 397	Introduction to Public History	
HIST 424	History of Art, Thought and Literature	
HIST 438	Antiquity and Modernity	
HIST 481	Time Traveling Through New Mexico's Past	
HIST 483	Historic Preservation	

HIST 486	Interpreting Historic Places for the Public	
Total Credits		9

## Art - Master of Arts Emphasis: Art History

An emphasis in art history requires a minimum of 33 credits of art history courses, 6 of which may be thesis credits. Of the required minimum, 6 credits of related courses may be substituted with the approval of the department head and the student's major advisor.

Reading proficiency in a foreign language is also required and should be acquired prior to the beginning of thesis research for which it will be employed. A reading proficiency exam will be arranged in conjunction with the major advisor. Admission to the MA program with an emphasis in art history is based on an accredited BA or BS degree (or equivalent) with a major in art history, including at least 24 art history credits and 9 studio credits. Undergraduate deficiencies must be completed before advancement to candidacy.

### Candidacy and Thesis Committee Selection

Upon satisfactory completion of all required course work (except thesis credits) and foreign language requirement, the student will prepare a thesis proposal under the direction of the major professor. The student will then select the second member of his or her thesis committee and submit the proposal to this committee member for approval. With the backing of these two advisors, the student must then present the proposal to the department faculty. After a successful presentation, the student will advance to candidacy and select the third committee member, who may be from outside the art department.

### Admission

All applicants for admission to the MA program must submit

1. A polished undergraduate research paper
2. A written statement of intent
3. Letters of recommendation from three qualified people of the applicant's choice
4. Official undergraduate transcripts.

Research papers, statement of intent, and letters of recommendation should be sent to the Department of Art. Applications and official undergraduate transcripts should be sent directly to the Graduate School. Psychometric test scores are not required.

### Application Deadline

The final submission date for all application materials and teaching assistantship applications is January 20th for the following year.

## Art - Master of Fine Arts Emphasis: Studio Art

Art requirements for an MFA degree with an emphasis in studio art include a minimum of 60 credits of academic work, usually completed in three years. Of those 60 credits,

- 9 must be taken in art history,
- 6 in non-art courses numbered 450 or above,
- 6 in thesis work,
- 3 in graduate seminar: art theory, criticism, historiography and

- 12 in ART 596 Graduate Studio Seminar.

In order to remain in good standing in the MFA program, a student must maintain an average GPA of 3.0. Any grade lower than B- in an Art Department graduate course is considered failing. In the event that a student fails a required course, they must repeat the class in order to get credit for it. If a student is awarded a graduate assistantship, he or she must maintain an average GPA of 3.0.

#### Program Requirements

Art history courses	9	
Non-art 450 level or higher courses	6	
Studio Thesis	6	
ART 579	Graduate Seminar: Art Theory, Criticism, Historiography	3
ART 596	Graduate Studio Seminar	12-18
Studio Electives	18-24	
Total Credits	54-66	

#### Semester Reviews

At the end of the first two semesters, each graduate student's creative production will be reviewed by the assembled faculty. Participation in semester reviews are required for successful completion of graduate level studio courses.

#### Candidacy

Candidacy occurs during the third semester of study in residency. Candidacy consists of a formal review of the student's work by the assembled graduate faculty. The graduate faculty advances the student to his or her final 3 semesters of study by a majority vote. If the faculty does not advance the student, candidacy may be repeated one additional time at the end of the next consecutive semester. The final three semesters of thesis work will commence from that point. Students who are not successful in their second candidacy attempt will be dis-enrolled from the MFA program.

#### Thesis Committee

At the end of the third semester and after a successful candidacy the student will propose his or her thesis committee, consisting of two department of art graduate faculty members, and one faculty member from outside the department.

#### Thesis Exhibition

The studio thesis will culminate in an exhibition of the candidate's creative works and a written thesis statement. A successful oral examination and defense of the thesis and exhibition is required for graduation. Two copies of the thesis and a photographic record of the final exhibition are required; other requirements may be determined by the graduate faculty. Students who do not satisfactorily complete their oral examination may not participate in the thesis exhibition.

Thesis exhibitions for the MFA degree will be held in the spring semester in the University Art Gallery. Students who wish to graduate at mid-year are obligated to find an exhibition space other than the NMSU Art Gallery that meets with the approval of the graduate committee. In this case the student is responsible for making all arrangements for the thesis exhibition.

#### Admission

Admission to the MFA program in studio art is based on an accredited BA, BS, or BFA degree (or equivalent) with a major in art, including at least 45 credits in studio art courses and 15 credits in art history, 9 of which must be 300-level or above (or equivalent). Any deficiencies must be corrected by undergraduate course work to be completed before advancement to candidacy. Exceptions to these requirements will be considered by the graduate committee. Students with an earned MA may be considered with the consent of the faculty, for advancement to candidacy for the MFA degree upon completion of one semester or 9 credits in residence at NMSU. The number of transferable credits from a previous graduate program will be determined by the department head and the graduate advisor before consideration for candidacy.

All applicants for admission to the MFA program in studio art must submit

- Submit a portfolio of 20 images to Slideroom: <https://nmsu.slideroom.com/>
- Include an Image List that identifies each piece by title, date, size and media.
- A written statement of intent, including scholarly and professional goals and the applicant's interest in studying at NMSU
- Letters of recommendation from three qualified people of the applicant's choice
- Official undergraduate transcripts

Admission to the MFA program in studio art will be decided upon consideration of all materials. Application guidelines are available on the Departmental website. The majority of teaching assistantships and studio spaces are awarded in the fall. Psychometric test scores are not required.

#### Application Deadline

The final submission date for all application materials and teaching assistantship applications is January 20th for the following year.

## Astronomy

### Undergraduate Program Information

The department offers an undergraduate astronomy minor degree, which requires 18-20 credits. The department does not offer a BS degree but encourages interested students to enroll in the physics program as a first step toward a career in astronomy. Our 100- and 300-level courses meet various university general education requirements. All students are invited to share with us this exciting area of study, through our basic and advanced undergraduate courses

#### Course List <sup>1</sup>

ASTR 105G	The Planets	4
ASTR 110G	Introduction to Astronomy	4
ASTR 301V	Revolutionary Ideas in Astronomy	3
ASTR 305V	The Search for Life in the Universe	3
ASTR 308V	Into the Final Frontier	3
ASTR 330V	Planetary Exploration	3
ASTR 400	Undergraduate Research	1-3
ASTR 401	Topics in Modern Astrophysics	3
ASTR 402	Introduction to Astronomical Observations and Techniques	3

<sup>1</sup> Other courses at the 300 and 400-levels are offered on an occasional basis. Consult the "Course Descriptions" section in this catalog.

## Graduate Program Information

The Department of Astronomy offers graduate work leading to the Doctor of Philosophy and Master of Science degrees. To be admitted as a regular student to the NMSU Graduate School as a major in astronomy, a student must present a suitable undergraduate background with emphasis (12-16 credits) on junior-senior level physics, and mathematics. The prospective student is also required to take aptitude and physics (or approved specialized field) sections of the Graduate Record Examination (GRE).

Information on assistantships and fellowships in teaching and research can be obtained from the department.

Each entering graduate student will be assigned a committee that will guide the student in choice of courses, suggest training needed to remedy deficiencies and determine specific degree requirements in accord with the student's needs and objectives, and in agreement with departmental policies. The program requires 33 traditional course credit hours (11 classes), 4 seminar class credit hours, plus research in astronomy. Each student must demonstrate no later than during the second year sufficient academic and research ability to qualify for continuation in doctoral studies.

It is possible, through arrangement with the Department of Physics, to obtain a Master of Science degree in physics during progress toward the Ph.D. in astronomy. See the Department of Physics (p. 399) section in this catalog for details of that program.

The MS degree in astronomy is closely connected with the astronomy Ph.D. program, and questions concerning requirements should be directed to the department.

Qualifying, Comprehensive and Final examinations are described elsewhere in this catalog. Questions concerning styles of the examinations should be directed to the department head.

The department has access to several different observing facilities. NMSU operates the Apache Point Observatory on behalf of the Astrophysical Research Corporation and the observatory is home to several telescopes:

- the ARC 3.5m telescope,
- a 1m telescope fully owned by NMSU
- the ARCSAT 0.5m telescope, and
- the Sloan Digital Sky Survey (SDSS) 2.5m telescope.

The Department is a full partner in the SDSS project. The Department also operates a 24-inch telescope on Tortugas Mountain, near the NMSU campus.

The department is home to NASA's Planetary Data System's Planetary Atmosphere Node, where solar system exploration data are archived.

## Degrees for the Department

Astronomy - Master of Science (p. 214)

Astronomy - Doctor of Philosophy (p. 214)

## Minors for the Department

Astronomy - Undergraduate Minor (p. 212)

**Professor, Jon Holtzman, Department Head**

**Professors** Chanover, Churchill, Murphy, Klypin, Walterbos; **Associate Professors** Jackiewicz, McAteer; **Assistant Professors** Finlator, Prescott; **College Professors** Beebe, Webber; **Observatory Specialist** Harrison

*J. Holtzman, Department Head, Ph.D. (California- Santa Cruz)– stellar populations in galaxies; R. F. Beebe, Ph.D. (Indiana-Bloomington)– planetary astronomy and stellar spectra; N. Chanover, Ph.D. (New Mexico State)– planetary astronomy; C. Churchill, Ph.D. (California-Santa Cruz)– galaxies and intergalactic medium; K. Finlator, Ph.D. (University of Arizona)- Galaxy Evolution, the Intergalactic Medium, Cosmological Reionization; Harrison, Ph.D. (Minnesota)– cataclysmic variables and gamma-ray burst sources; J. Jackiewicz, Ph.D. (Boston College)– Helioseismology, theoretical condensed matter physics; A. Klypin, Ph.D. (Moscow)– cosmology; R. T. J. McAteer, Ph.D. (Queen's University, Belfast)– solar physics, Sun-Earth connection; J. Murphy, Ph.D. (U. Washington)– planetary atmospheres and exploration; M. Prescott, Ph.D. (University of Arizona)- Lyman-alpha nebulae, kinematics of gas within cosmic web; R. Walterbos, Ph.D. (Leiden)– interstellar medium, star formation, and structure and evolution of galaxies; W. Webber, Ph.D. (Iowa)– high energy astrophysics*

## Astronomy Courses

**ASTR 105G. The Planets**

**4 Credits (3+2P)**

Comparative study of the planets, moons, comets, and asteroids which comprise the solar system. Emphasis on geological and physical processes which shape the surfaces and atmospheres of the planets. Laboratory exercises include analysis of images returned by spacecraft. Intended for non-science majors, but some basic math required. This lecture/lab course satisfies the New Mexico Common Core Area III: Lab Sciences requirement

**ASTR 110G. Introduction to Astronomy**

**4 Credits (3+2P)**

A survey of the universe. Observations, theories, and methods of modern astronomy. Topics include planets, stars and stellar systems, black holes and neutron stars, supernovas and gaseous nebulae, galaxies and quasars, and cosmology. Emphasis on physical principles involving gravity, light and optics (telescopes). Generally non-mathematical. Laboratory involves use of the campus observatory and exercises designed to experimentally illustrate principles of astronomy. This lecture/lab course satisfies the New Mexico Common Core Area III: Lab Sciences requirement.

**ASTR 199. Introduction to Astronomy Lab, Special**

**1 Credit**

This lab-only listing exists only for students who may have transferred to NMSU having taken a lecture-only introductory astronomy class, to allow them to complete the lab requirement to fulfill the general education requirement. Consent of Instructor required. , at some other institution). Restricted to Las Cruces campus only.

**Prerequisite(s):** Must have passed Introduction to Astronomy lecture-only (e.g.

**ASTR 301V. Revolutionary Ideas in Astronomy****3 Credits**

Examines recent fundamental scientific revolutions that have shaped our view of Earth and the universe. Topics in astronomy range from exoplanets to black holes to dark energy and raise questions about the very nature of how we use the scientific method to see the unseen, and how this shapes science research today.

**Prerequisite(s):** Any general education science course.

**ASTR 305V. The Search for Life in the Universe****3 Credits**

Use of information from several of the sciences to explore the likelihood that life exists elsewhere in the universe. Subjects include an overview of historical ideas about the possibility of life elsewhere in the universe, the chemistry and biology of life on Earth, recent explorations for life within our solar system, and current search strategies for life in the universe and their scientific basis.

**ASTR 308V. Into the Final Frontier****3 Credits**

Exploration of space: a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. Same as HON 308V.

**ASTR 330V. Planetary Exploration****3 Credits**

A current planetary exploration mission is studied within the context of the solar system. The data acquired and principles involved in executing the mission, as well as political and economic implications of planetary exploration, are examined. Same as HON 330V. Main campus only

**ASTR 400. Undergraduate Research****1-3 Credits**

Supervised individual study or research. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**ASTR 401. Topics in Modern Astrophysics****3 Credits**

This course is designed for students interested in astrophysics who have some background in math and physics and want to learn about basic astrophysics and interesting current topics. The course will cover basic astrophysical concepts such as orbital mechanics, light, and radiative processes and transfer. These concepts will be applied to the discussion of exciting modern topics involving planets, exoplanets, stars, galaxies, and/or cosmology, with topical emphasis determined by the instructor.

**Prerequisite(s):** MATH 192G and (PHYS 213 or PHYS 215G).

**ASTR 402. Introduction to Astronomical Observations and Techniques****3 Credits**

Designed for students interested in astrophysics who have some background in math and astronomy and want to learn about techniques for obtaining and analyzing astronomical data. This course will review the properties of light and discuss the process of experimental design. The course will describe basic observational tools such as telescopes and detectors. It will discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for. Some topics in basic astronomical data analysis will be discussed, with topical emphasis determined by the instructor. Some simple data analysis projects will be assigned.

**Prerequisite(s):** MATH 191G and (PHYS 214 or PHYS 216G) and (ASTR 105G, ASTR 110G, or ASTR 401).

**ASTR 500. Seminar****1 Credit**

Organized group study treating selected topics.

**ASTR 506. Stellar Dynamics and Hydrodynamics****3 Credits**

Graduate level course on basic stellar dynamics and fundamentals of hydrodynamics.

**ASTR 535. Observational Techniques I (f)****3 Credits**

Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.

**ASTR 545. Stellar Spectroscopy****3 Credits**

This course covers the physics of stellar atmospheres with emphasis on using spectra as a diagnostic tool for understanding the properties of stars. Topics include spectral classification, radiative transfer, gas equilibrium physics, line and continuum opacities, adiabatic and superadiabatic convection, and extraction of observed quantities from spectra for deducing physical conditions of the source.

**ASTR 555. Galaxies I****3 Credits**

Fundamentals of the properties of galaxies and the components that they are made of stars and stellar populations, gas and dust, central black holes, and dark matter. Introduction to basic concepts of galaxy formation.

**ASTR 565. Stellar Interiors****3 Credits**

Internal constitutions of stars, computation of stellar models, and stellar evolution.

**ASTR 575. Computational Astrophysics****3 Credits**

Scientific programming for astronomical applications. Explore key algorithms and standard techniques for astronomical data analysis. Topics may include pointers, data structures, dynamic memory allocation, least squares fitting, grid and iterative search methods, LCG random number generators, Monte Carlo simulations, numerical integration, and astronomical image and spectrum manipulation. Applications to real astronomical datasets are emphasized.

**ASTR 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental.

**ASTR 599. Master's Thesis****15 Credits**

Master's level research in astrophysics or observational astronomy.

**ASTR 600. Pre-dissertation Research****1-15 Credits**

Research.

**ASTR 605. Interstellar Medium****3 Credits**

Basics of radiative transfer and processes in the interstellar medium. Properties of dust and infrared emission from grains. Applications to neutral atomic and molecular gas and ionized plasmas in galaxies. May be repeated up to 3 credits.

**ASTR 610. Radio Astronomy****3 Credits**

Techniques in observational radio astronomy, including single dish and interferometer arrays. Physical processes that produce radio emission, with a focus on continuum emission. May be repeated up to 3 credits.

**Prerequisite(s):** Consent of instructor.

**ASTR 616. Galaxies II****3 Credits**

Advanced topics in galaxies. Includes a detailed description and understanding of the Milky Way and topics in galaxy formation and evolution.

**ASTR 620. Planetary Surface and Atmospheric Processes****3 Credits**

Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.) May be repeated up to 3 credits. Restricted to: ASTR majors.

**ASTR 621. Planetary System Formation****3 Credits**

The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy. May be repeated up to 3 credits. Restricted to: ASTR majors.

**ASTR 625. Cosmology****3 Credits**

Discussion of our current knowledge of the structure of the universe and current research methods. Topics include the distance scale, clustering of galaxies, large-scale structure, metrics, dark matter, and cosmological probes such as distant quasars, radio galaxies, and gravitational lenses.

**ASTR 630. Numerical and Statistical Methods in Astrophysics****3 Credits**

Provides basic background in numerical and statistical methods relevant to astrophysical research. Topics include a review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, and other topics. May be repeated up to 3 credits.

**ASTR 670. Heliophysics****3 Credits**

Explore the Sun and its processes, the heliosphere, and its interactions with the planets. Topics include: A introductory description of space weather and its physics; energy interaction with the space environment; the quiet Sun and its interactions with planetary atmospheres (with an emphasis on Earth); Magnetohydrodynamics; frozen-in flux; the solar wind; magnetized fluid dynamics; the active Sun (flares and coronal mass ejections); the effects of Space Weather.

**ASTR 698. Special Topics.****1-9 Credits**

Special topics.

**ASTR 700. Doctoral Dissertation****15 Credits**

Dissertation.

**Phone:** (575) 646-4438

**Website:** <http://astronomy.nmsu.edu/>

## Astronomy - Undergraduate Minor

The department offers a minor created for majors in a variety of scientific fields, and two minor emphases specifically designed to address the needs and interests of students from the Colleges of Education and Engineering. Any undergraduate, however, may pursue any of the three minor tracks.

### Requirements

The requirements for the regular minor requires 19 credits, from the following:

#### Requirements

ASTR 105G	The Planets	4
or ASTR 110G	Introduction to Astronomy	
Select two from the following: <sup>1</sup>		6
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
Select 9 credits between the following groups: <sup>2</sup>		9
<i>Group A</i>		
Select 6-9 credits from the following: <sup>2</sup>		
ASTR 401	Topics in Modern Astrophysics	
ASTR 402	Introduction to Astronomical Observations and Techniques	
<i>Group B</i>		
Select 3-9 credits from the following: <sup>2,4</sup>		
A E 424	Aerospace Systems Engineering	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 473	Ecology of Microorganisms	
C S 475	Artificial Intelligence I	
C S 482	Database Management Systems I	
C S 483	Introduction to Robotics	
C S 491	Parallel Programming	
CHEM 360	General Geochemistry	
CHEM 431	Physical Chemistry	
CHEM 433	Physical Chemistry I	
E E 454	Antennas and Radiation	
E E 460	Space System Mission Design and Analysis	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
GEOL 465	Isotope Geochemistry	
MATH 471	Complex Variables	
MATH 472	Fourier Series and Boundary Value Problems	
PHYS 451	Intermediate Mechanics I	
PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 480	Thermodynamics	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

STAT 480	Statistics: Theory and Applications	
Total Credits		19

- <sup>1</sup> Three credits of ASTR 400 Undergraduate Research may replace one of these courses.
- <sup>2</sup> ASTR 401 Topics in Modern Astrophysics and ASTR 402 Introduction to Astronomical Observations and Techniques are the preferred classes but are generally offered only in alternate years. Three credits of ASTR 400 Undergraduate Research may replace one of these courses, but not the same three if used above.
- <sup>3</sup> Cross-listed with graduate classes and require special permission.
- <sup>4</sup> Alternative 400-level courses in the physical sciences, engineering, or related fields, including one-time seminars, may be proposed on a case-by-case basis to fulfill this requirement, drawn from the fields of astronomy, biochemistry, biology, chemistry, computer science, geology, geophysics, mathematics, physics, statistics or from engineering. Proposals should include a clear justification that connects the course materials to a particular topic in astronomy or astrophysics.

## Emphasis: Education

The requirements for the education track minor requires 18-20 credits from the following:

ASTR 105G	The Planets	4
ASTR 110G	Introduction to Astronomy	4
Select two from the following:		6
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
Select 4-6 credits from the following: <sup>5</sup>		4-6
ASTR 400	Undergraduate Research	
ASTR 401	Topics in Modern Astrophysics	
ASTR 402	Introduction to Astronomical Observations and Techniques	
EDUC 451	Methods of Teaching Elementary School Science	
EDUC 463	Teaching Science at the Middle and High School Level	
Total Credits		18-20

- <sup>5</sup> This requirement will generally be fulfilled by two 3-credit courses. Students may request the 4 credit option instead, if an appropriate topic and instructor for 1 credit of ASTR 400 Undergraduate Research are available. ASTR 401 Topics in Modern Astrophysics and ASTR 402 Introduction to Astronomical Observations and Techniques are generally offered only in alternate years, and have prerequisites.

## Emphasis: Engineering

The requirements for the engineering track minor requires 18-19 credits from the following:

### Required Courses

Select 3-4 credits from the following:		3-4
ASTR 105G	The Planets	
ASTR 110G	Introduction to Astronomy	

PHYS 215G	Engineering Physics I	
PHYS 216G	Engineering Physics II	
Select one from the following:		3
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
Select 12 credits from the following two groups:		12
<i>Group A</i>		
Select 6-9 credits from the following: <sup>6</sup>		
A E 428	Aerospace Capstone Design	
ASTR 400	Undergraduate Research	
ASTR 401	Topics in Modern Astrophysics <sup>7</sup>	
ASTR 402	Introduction to Astronomical Observations and Techniques <sup>7</sup>	
E E 400	Undergraduate Research	
E E 418	Capstone Design I	
E E 419	Capstone Design II	
M E 400	Undergraduate Research	
<i>Group B</i>		
Select 3-6 credits from the following: <sup>9</sup>		
A E 424	Aerospace Systems Engineering	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 473	Ecology of Microorganisms	
C S 475	Artificial Intelligence I	
C S 482	Database Management Systems I	
C S 483	Introduction to Robotics	
C S 491	Parallel Programming	
CHEM 360	General Geochemistry	
CHEM 431	Physical Chemistry	
CHEM 433	Physical Chemistry I	
E E 454	Antennas and Radiation	
E E 460	Space System Mission Design and Analysis	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
GEOL 465	Isotope Geochemistry	
MATH 471	Complex Variables	
MATH 472	Fourier Series and Boundary Value Problems	
PHYS 451	Intermediate Mechanics I	
PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 480	Thermodynamics	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
STAT 480	Statistics: Theory and Applications	
Total Credits		18-19

- <sup>6</sup> Taking any of the non-astronomy classes for this requirement requires prior approval from the head of astronomy on a case-by-case basis, with a clear connection being established between the proposed research or design project and a particular topic in astronomy or astrophysics (astronomy instrumentation or observational projects are particularly encouraged); no more than 3 non-ASTR credits can be counted toward the minor.
- <sup>7</sup> Generally offered in alternate years.
- <sup>8</sup> Cross-listed with graduate classes and require special permission.
- <sup>9</sup> Alternative 400-level courses in the physical sciences, engineering, or related fields, including one-time seminars, may be proposed on a case-by-case basis to fulfill this requirement, drawn from the fields of astronomy, biochemistry, biology, chemistry, computer science, geology, geophysics, mathematics, physics, statistics, or from engineering. Proposals should include a clear justification that connects the course materials to a particular topic in astronomy or astrophysics.

## Astronomy - Master of Science

The Astronomy Department at NMSU offers programs leading to the Master of Science and the Doctor of Philosophy degrees. Graduate courses ([http://astronomy.nmsu.edu/?page\\_id=2503](http://astronomy.nmsu.edu/?page_id=2503)) cover topics in astrophysics, stellar atmospheres, observational techniques, the interstellar medium, galactic structure, star formation and evolution, extragalactic objects, cosmology, and solar system studies. Students also take courses in other relevant fields to broaden their knowledge and capabilities.

## Astronomy - Doctor of Philosophy

The Astronomy Department at NMSU offers programs leading to the Master of Science and the Doctor of Philosophy degrees. Graduate courses ([http://astronomy.nmsu.edu/?page\\_id=2503](http://astronomy.nmsu.edu/?page_id=2503)) cover topics in astrophysics, stellar atmospheres, observational techniques, the interstellar medium, galactic structure, star formation and evolution, extragalactic objects, cosmology, and solar system studies. Students also take courses in other relevant fields to broaden their knowledge and capabilities.

## Biology

### Undergraduate Program Information

A student may earn the Bachelor of Arts in biology or the Bachelor of Science in biology, genetics, microbiology or conservation ecology through major studies in the Department of Biology. The Bachelor of Science in biology or microbiology is recommended for premedical and pre dental students, for those preparing to teach biology and other sciences at the secondary and college levels, for those interested in the numerous fields of biological research and applied biology, and for those planning on obtaining an advanced degree in biology.

Freshmen should begin taking required biology and chemistry courses in their first year. Students are required to speak with an advisor as soon as they declare a major within the department. The department welcomes students considering a biology major who wish preliminary advising. More information on the Department of Biology is available on our web site, <http://bio.nmsu.edu>.

A student must earn a grade of C- or better to receive credit for any nondepartmental or departmental requirement for any major or minor offered by the Department of Biology.

It is strongly recommended that students include a minor or supplementary course work in a specific discipline to enhance their academic experience. See the "Programs A-Z" (p. 13) section of this catalog for specific minors and see the departmental sections for the requirements for each. Selection of a minor or a supplementary coursework area should be done in consultation with an advisor.

The department offers a minors in biology, microbiology, human biology and conservation ecology. A student may not earn a major and a minor in the same discipline.

A student must fulfill a second language requirement to receive a Bachelor of Arts or Bachelor of Science degree in the Biology and Microbiology majors. ***This requirement does not apply to the Conservation Ecology major, offered jointly with the Department of Fisheries, Wildlife and Conservation Ecology, or the Genetics major, offered jointly with the Department of Plant and Environmental Science.*** To meet the second language requirement, the student must do one of the following:

- Complete two semesters of second language courses numbered 111 and 112 with a grade of C- or better. Spanish speakers should enter and complete SPAN 113 Spanish for Heritage Learners I, SPAN 213 Spanish for Heritage Learners II or SPAN 214 Spanish for Heritage Learners III with a C- or better to fulfill the requirement.
- Challenge the 112 level of French, Chinese, German, Japanese, or Spanish; or the 113 level for the Spanish-for Heritage Learners student or the 213 level for Portuguese.
- Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level. (i.e. equivalent to FREN 112 Elementary French II, GER 112 Elementary German II, SPAN 112 Elementary Spanish II, etc.)
- Complete two semesters of American Sign Language, courses C D 374 American Sign Language I and C D 375 American Sign Language II, with a grade of C- or better.

## Graduate Program Information

The Department of Biology offers graduate study leading to the Doctor of Philosophy and Master of Science degrees. Our goal is to prepare students for careers in the various fields in biology through formal coursework and research experiences as well as through seminars and discussion groups.

All prospective applicants must submit the materials specified in the current Department Graduate Application Packet that is available at the Graduate Student section of the Biology website <http://bio.nmsu.edu/grads/>. The Departmental Graduate Application Packet also describes how to apply for Graduate Assistantships. These assistantships are awarded based on departmental needs and student merit; in general they are reserved for Ph.D. and thesis Master of Science students, and are not available to non-thesis Master of Science students.

There are three formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are

BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3

BIOL 610 Seminar 1-3

Students are required to successfully complete the Seminar course once each year that they are in the program.

For research toward the Master of Science or the Ph.D., students can choose among the Department's three areas of emphasis:

1. Behavioral, Ecological and Evolutionary Biology
2. Cell and Organismal Biology
3. Microbiology

All graduate students should develop their curriculum plan in consultation with their faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website <http://bio.nmsu.edu/grads/>. Graduate students may also take a minor in other graduate departments and programs.

## Degrees for the Department

Biology - Bachelor of Science (p. 224)

Biology - Bachelor of Arts (p. 223)

Microbiology - Bachelor of Science (p. 228)

Conservation Ecology - Bachelor in Conservation Ecology (p. 225)

Genetics and Biotechnology - Bachelor of Science in Genetics (p. 226)

Biology - Master of Science (p. 230)

Biology - Doctor of Philosophy (p. 231)

## Minors for the Department

Biology - Undergraduate Minor (p. 229)

Microbiology - Undergraduate Minor (p. 230)

Conservation Ecology - Undergraduate Minor (p. 229)

Genetics and Biotechnology - Undergraduate Minor (p. 230)

Human Biology - Undergraduate Minor (p. 230)

**Michelle Nishiguchi, Professor, Department Head**

**Jennifer Curtiss, Associate Professor, Associate Department Head**

**Professors** Boecklen, Hanley, Houde, Milligan, Nishiguchi, C. Shuster, Serrano, Smith, Unquez, Wright; **Associate Professors** Bailey, Curtiss, Hansen, Mabry, M. Shuster, Xu; **Assistant Professors** Castillo, Indriolo, Ferrenberg, James, Lodato, Lopez

*C. D. Bailey, Ph.D. (Cornell)– plant systematics; W. J. Boecklen, Ph.D. (Northern Arizona)– plant/ insect and community ecology; M. G. Castillo, Ph.D. (Wisconsin)– microbiology/immunology; J. Curtiss, Ph.D. (University of Colorado at Boulder)– cell and development; S. Ferrenberg, Ph.D. (University of Colorado at Boulder)- plant/insect interactions; K. A. Hanley, Ph.D. (California-San Diego)– evolution, ecology, and control of flaviviruses; I. A. Hansen, Ph.D. (University of Wurzburg)– molecular vector biology; P. W. Houde, Ph.D. (Howard)– avian systematics; E. Indriolo, Ph.D. (Perdue)- plant signalling; K. E. Mabry, Ph.D. (California-Davis)– behavioral ecology; B. G. Milligan, Ph.D. (California-Davis)– plant evolutionary biology; M.K. Nishiguchi, Ph.D. (California-Santa Cruz)– evolutionary microbiology, marine symbiosis;*

*E. E. Serrano, Ph.D. (Stanford)– biophysics, neuroscience; C. B. Shuster, Ph.D. (Tufts)– cell and developmental biology; M. Shuster, Ph.D. (Tufts)– biology education; G. B. Smith, Ph.D. (North Carolina State)– environmental microbiology; G. A. Unquez, Ph.D. (California-Los Angeles)– developmental biology; T. F. Wright, Ph.D. (California-San Diego)– animal behavior and evolution; J. Xu, Ph.D. (Military Medical University, Shanghai)– mosquito-malaria interactions.*

## Biology Courses

### BIOL 101G. Human Biology

#### 3 Credits

Introduction to modern biological concepts. Emphasis on relevance to humans and their relationships with their environment. Cannot be taken for credit after successful completion of BIOL 111G or BIOL 211G. Appropriate for non-science majors. Requires successful completion of BIOL 101GL in order to meet the NM Common Core Area III Laboratory Science requirements.

### BIOL 101GL. Human Biology Laboratory

#### 1 Credit

Laboratory for BIOL 101G. Laboratory experiences and activities exploring biological concepts and their relevance to humans and their relationship with their environment.

**Prerequisite(s)/Corequisite(s):** BIOL 101G.

### BIOL 110G. Contemporary Problems in Biology

#### 4 Credits (3+3P)

Fundamental concepts of biology will be presented using examples from relevant problems in ecology, medicine and genetics. For nonscience majors only. Community Colleges only.

### BIOL 111G. Natural History of Life

#### 3 Credits (3)

Survey of major processes and events in the genetics, evolution, and ecology of microbes, plants and animals, and their interactions with the environment. Appropriate for science and nonscience majors. Must be taken with BIOL 111L to meet general education requirements. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** Currently enrolled in MATH 120, grade of C- or better in MATH 120, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 120.

### BIOL 111GL. Natural History of Life Laboratory

#### 1 Credit

Laboratory experiments, demonstrations and exercises on interrelationships among organisms, biodiversity, processes of evolution, and interaction of organisms and their environment. Appropriate for science and nonscience majors. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** BIOL 111G; Currently enrolled in MATH 120, grade of C- or better in MATH 120, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 120.

### BIOL 150. Topics in Biology

#### 1-3 Credits (1-3)

Introductory level coverage of biological topics. May be repeated up to 9 credits.

### BIOL 154. Introductory Anatomy and Physiology

#### 4 Credits (3+3P)

Survey of human structure and function (does not replace BIOL 190, BIOL 111G, or BIOL 211G as a prerequisite for advanced courses in biology). Restricted to: Community Colleges only.

**BIOL 211G. Cellular and Organismal Biology****3 Credits**

Principles of cellular structure and function, genetics, and organismal physiology. This course prepares the student for continuation in science or allied health fields. Suitable for all majors. Must be taken with BIOL 211L to meet general education requirements. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** a C- or better in MATH 120 or higher and a C- or better in CHEM 110G or CHEM 111G or CHEM 115.

**BIOL 211GL. Cellular and Organismal Biology Laboratory****1 Credit**

Laboratory demonstrations, experiments and exercises on molecular and cellular biology and organismal physiology. Must have passed BIOL 211G or be concurrently enrolled in BIOL 211G and BIOL 211L. Pre/ May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** a C- or better in BIOL 211G, MATH 120 or higher, and a C- or better in CHEM 110G or CHEM 111G or CHEM 115.

**BIOL 219. Public Health Microbiology****3 Credits**

The characteristics of pathogenic microorganisms and the diseases that they cause. Will not meet the microbiology requirements for biology or medical technology majors.

**Prerequisite:** BIOL 211G and BIOL 211GL.

**BIOL 221. Introductory Microbiology****3 Credits**

Principles of isolation, taxonomy, and physiology of microorganisms. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEM 110G or CHEM 111G or CHEM 112G.

**Corequisite(s):** BIOL 221 L.

**BIOL 221 L. Introductory Microbiology Laboratory****1 Credit**

A laboratory course to accompany BIOL 221 or BIOL 219.

**Prerequisite:** BIOL 221 or BIOL 219 or concurrent enrollment.

**BIOL 225. Human Anatomy and Physiology I****4 Credits (3+3P)**

The first in a two-course sequence that covers the structure and function of the human body, including terminology of the human gross anatomy, chemistry overview, cell structure, cell physiology (including DNA, protein synthesis and cell division). The organization of cells and tissues and their metabolic and homeostatic processes and regulation are also covered. Physical and chemical operation of organs and systems of the human body include the integumentary, skeletal, muscular, and nervous systems. Pre/ Restricted to: Community Colleges only.

**Corequisite(s):** CHEM 110G or CHEM 111G.

**BIOL 226. Human Anatomy and Physiology II****4 Credits (3+3P)**

The second in a two-course sequence that covers the structure and function of the human body. Includes the physical and chemical operation of the organs and systems of the human body, including endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary and reproduction system. Concepts of nutrition, metabolism, energy, fluid and electrolyte balance, heredity pregnancy and human embryonic and fetal development are also covered. Restricted to: Community Colleges only.

**Prerequisite(s):** BIOL 225, CHEM 110G or CHEM 111G.

**BIOL 227. Pathophysiology****3 Credits**

A study of the structure and function of the human body with specialized emphasis on disease processes.

**Prerequisite(s):** AHS 153 or BIOL 225 Corequisite/Prerequisites(s): AHS 154 or BIOL 226 Restricted to: Community Colleges only.

**BIOL 250. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits. Community Colleges only.

**BIOL 253. Human Anatomy****4 Credits (3+3P)**

Detailed presentations of human anatomy, with laboratory. For nursing, prenursing, and human nutrition and food science majors only. Restricted to: HNFS, PNUR majors.

**Prerequisite(s):** Grade of C- in BIOL 211G and either CHEM 111G or CHEM 110G.

**BIOL 254. Human Physiology****3 Credits**

Physical and chemical operation of the organs and systems of the human body. Not open to students who have passed BIOL 354 or BIOL 381.

**Prerequisite(s):** Grade of at least C- in BIOL 211G; BIOL 211GL; CHEM 111G or CHEM 110G.

**BIOL 262. Human Pathophysiology I****3 Credits**

The first in a two-course sequence that covers changes in body physiology that result from disease or injury. Includes a general introduction to pathophysiology as well as an overview of altered cellular and tissue biology, injury, inflammation, and neoplasia. Students will also explore deviation from fluid, hemodynamic, and endocrinologic balance. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of C- or higher in BIOL 225 and BIOL 226.

**BIOL 263. Pathophysiology II****3 Credits**

The second in a two-course sequence that covers changes in body physiology that result from disease or injury. This course focuses on the pathophysiology of the nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of C- or higher in BIOL 225, BIOL 226, and BIOL 262.

**BIOL 301. Principles of Ecology****3 Credits**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. MATH 191G and A ST 311 recommended. Same as E S 301. Crosslisted with: E S 301.

**Prerequisite(s):** BIOL 111G, MATH 121G.

**BIOL 302. Molecular Biology Techniques Laboratory****3 Credits**

This combined lecture and laboratory course emphasizes molecular biology laboratory practices through the hands-on application of commonly applied techniques, protocols, and equipment. The topics covered include both the fundamental development of empirical data as well as data analysis using stand-alone and web-based resources. Consent of instructor required.

**Prerequisite(s):** BIOL 211G or equivalent, and MATH 121G.

**BIOL 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: HORT 305 and AGRO 305.

**Prerequisite(s):** BIOL 111G and BIOL 211G, or BIOL 211G and BCHE 140, either CHEM 111G or CHEM 115, and MATH 121G.

**BIOL 309. Guided Biological Research Lab****3 Credits**

This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career undergraduates who have finished the introductory sequence of Biology courses. Topics will vary with instructor.

**Prerequisite(s):** BIOL 111G, BIOL 211G, and MATH 121G.

**BIOL 311. General Microbiology****3 Credits**

Principles of physiology, molecular biology, ecology, and taxonomy of microorganisms.

**Prerequisite(s):** BIOL 211G and MATH 121G.

**BIOL 311 L. General Microbiology Laboratory****2 Credits**

Microbiology techniques and procedures, including isolation and identification of microorganisms and biotechnology procedures that employ microorganisms.

**Prerequisite(s)/Corequisite(s):** BIOL 219 or BIOL 311. Prerequisite(s): BIOL 211G and MATH 121G.

**BIOL 312. Plant Taxonomy****3 Credits (2+3P)**

Classification and identification of representative plant families and local plants. Emphasis on ability to use technical sources. Saturday field trips may be recommended.

**Prerequisite(s):** BIOL 111G and MATH 121G.

**BIOL 313. Structure and Function of Plants****3 Credits (2+3P)**

Structure, function, and survey of plants. BIOL 211G recommended.

**Prerequisite(s):** BIOL 111G, MATH 121G, and sophomore-level standing.

**BIOL 314. Plant Physiology****3 Credits**

Photosynthesis, respiration, water relation of plants, minerals and organic nutrition, growth and development.

**Prerequisite(s):** BIOL 211G and CHEM 112G.

**BIOL 322. Zoology****3 Credits (2+3P)**

Structure, function, and survey of animals. BIOL 211G recommended.

**Prerequisite(s):** BIOL 111G, MATH 121G, and at least sophomore-level standing.

**BIOL 350. Special Topics****1-4 Credits**

Specific subjects announced in Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

**BIOL 351. Biology Internship****1-6 Credits**

Substantial off-campus experience in biology selected by student in consultation with regular biology faculty member. Internship must be approved by faculty member. Student will supply mutually agreed upon documentation of internship activities after the internship is completed. May be repeated up to 6 credits. Restricted to: BIOL, MBIO, CEC, GEOT majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** 45 college credits, 2.5 or better GPA, consent of instructor.

**BIOL 353. Pre-Professional Human Anatomy****4 Credits**

Pre-professional clinically-oriented survey of human anatomy. Designed primarily for pre-nursing majors. Provides comprehensive anatomical training for students planning careers in health and allied health sciences, such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. Suitable as a biology elective.

Concurrent enrollment in BIOL 354L is recommended but not required.

**Prerequisite(s):** BIOL 211G and either CHEM 110G, CHEM 111G, or CHEM 115.

**BIOL 353 L. Pre-Professional Human Anatomy Laboratory****1 Credit**

Laboratory experience in human anatomy using anatomical models and cat dissections. Designed as a learning aid to support and augment BIOL 353 pre-professional Human Anatomy. For students planning careers in health and allied health sciences such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science.

**Prerequisite(s)/Corequisite(s):** BIOL 253 or BIOL 353. Prerequisite(s): BIOL 211G and either CHEM 110G, CHEM 111G, or CHEM 115.

**BIOL 354. Physiology of Humans****3 Credits**

Principles of integrative functions in humans. A systems approach emphasizing tissues, organs, and their regulation.

**Prerequisite(s):** BIOL 211G and MATH 121G.

**BIOL 354 L. Laboratory of Human Physiology****1 Credit**

Laboratory to accompany BIOL 354.

**Prerequisite(s):** MATH 121G and either BIOL 254, BIOL 381, BIOL 354, or concurrent enrollment in BIOL 354.

**BIOL 373. Fungal Biology****3 Credits (3+2P)**

Same as EPWS 372.

**Prerequisite:** EPWS 310 or BIOL 311 or consent of instructor.

**BIOL 377. Cell Biology****3 Credits**

Fundamentals of eukaryotic cell structure, organization, and function. Emphasis on membranes, subcellular organelle systems, cytoskeleton, and cell cycle. Includes basic aspects of molecular biology. May be repeated up to 3 credits. BIOL 111G recommended.

**Prerequisite(s):** (BIOL 211G, BIOL 305 or GENE 315) and MATH 121G.

**BIOL 381. Animal Physiology****3 Credits**

Principles of integrative function in animals, emphasizing tissues, organs, organ systems, and regulation. Includes adaptations of animals to their environments. BIOL 111G and BIOL 377 recommended.

**Prerequisite(s):** BIOL 211G and junior-level standing, MATH 121G.

**BIOL 382. Plant Signalling and Development****3 Credits**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 305 or GENE 315, and MATH 121G.

**BIOL 385. An Introduction to Cancer****3 Credits**

This course will cover 3 areas of cancer research and their interdisciplinary connections: clinical cancer research, epidemiology and public health, and basic cancer research. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 305 or GENE 315 or equivalent and MATH 121G.

**BIOL 398. Biology Research Programs****1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

**BIOL 402. Biology Honors Thesis****1-3 Credits (1-3)**

Provides guidance in how to write a scientific paper in the sciences. Students will produce an honors thesis based on previous independent research. Consent of instructor required.

**Prerequisite(s):** MATH 121G and consent of instructor.

**BIOL 408. Ecology of Plants****3 Credits**

Controlling factors, succession, community dynamics, and the classification of vegetation.

**Prerequisite(s):** BIOL 301 and MATH 121G.

**BIOL 412. Seminar in Microbiology****1 Credit**

Seminar to aid students in assessment and presentation of current topics in microbiology. Graded: S/U.

**Prerequisite(s):** BIOL 311, BIOL 311L, and MATH 121G.

**BIOL 417. Topics in Environmental Microbiology****3 Credits**

This is an advanced undergraduate course based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA, and the human microbiome. Crosslisted with: BIOL 577.

**Prerequisite(s):** MATH 121G, BIOL 477 or consent of instructor.

**BIOL 423. Primate Adaption and Evolution****3 Credits**

Survey of the adaptations and evolutionary history of non-human primates. Consent of Instructor required. Crosslisted with: ANTH 473 .

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 423L when offered.

**BIOL 423 L. Primate Evolution Laboratory****1 Credit**

Laboratory with exercises on non-human primate adaptation and evolution. Crosslisted with: ANTH 473 L.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 423.

**BIOL 424. Human Osteology****3 Credits**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Crosslisted with: ANTH 474.

**Corequisite(s):** BIOL 424L when offered.

**Prerequisite(s)/Corequisite(s):** Recommend ANTH 355 or equivalent.

**BIOL 424 L. Human Osteology Lab****1 Credit**

Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: ANTH 474 L.

**Prerequisite(s):** Recommend ANTH 355 or equivalent.

**Corequisite(s):** BIOL 424.

**BIOL 427. Symbiosis****3 Credits**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 111G, BIOL 211G, and MATH 121G.

**BIOL 434. Human Evolution****3 Credits**

Overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. Crosslisted with: ANTH 434.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 434L when offered.

**BIOL 434 L. Human Evolution Laboratory****1 Credit**

Laboratory in human evolution, includes exercises and activities to learn the human fossil record. Crosslisted with: ANTH 434 L.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 434.

**BIOL 436. Disease Vector Biology****3 Credits**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Crosslisted with: BIOL 536

**Prerequisite(s):** BIOL 211G, BIOL 305, and MATH 121G.

**BIOL 442. Genomics Technology****3 Credits**

The course introduces current genomic techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics.

**Prerequisite(s):** BIOL 211G, BIOL 305 or BIOL 478 or GENE 315, and MATH 121G.

**BIOL 446. Bioinformatics and NCBI Database****3 Credits**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study.

**Prerequisite(s):** BIOL 211G, BIOL 305 or BIOL 478 or GENE 315, and MATH 121G.

**BIOL 450. Special Topics****1-3 Credits**

Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

**BIOL 451. Physiology of Microorganisms****3 Credits**

Aspects of cellular physiology unique to prokaryotes. BCHE 395 recommended.

**Prerequisite(s):** C- or better in BIOL 311, MATH 121G.

**BIOL 455. Biometry****3 Credits**

Biometry is the analysis of biological data using mathematical and statistical models. The course will cover basic theories of probability and statistics and will introduce principles of sampling, estimation, experimental design, and hypothesis testing. Students will analyze biological data using computer programs and will perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.

**Prerequisite(s):** BIOL 111G or BIOL 211G, and MATH 121G.

**BIOL 459. Darwinism Versus Creationism****3 Credits**

This course examines the debate regarding Creationism versus Darwinism as explanations for the origin and diversification of life on Earth. Topics covered include the nature and philosophy of science, new-world creationism, old-world creationism, intelligent design, history of evolutionary thought, modern evolutionary theory, and the Creationism-Darwinism debate at the societal, political, and educational interfaces. The course structure will include formal lectures and in-class discussion of assigned readings.

**Prerequisite(s):** BIOL 111G or BIOL 211G, and MATH 121G.

**BIOL 462. Conservation Biology****3 Credits**

Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally.

**Prerequisite(s):** BIOL 301 and either MATH 142G or MATH 191G.

**BIOL 465. Invertebrate Zoology****4 Credits (3+3P)**

Survey, ecology, behavior and physiology. BIOL 322 recommended.

**Prerequisite(s):** MATH 121G, BIOL 111G, and junior-level standing.

**BIOL 466. Invertebrate Zoology Field Trip****1 Credit**

A one-week field trip for the study of marine invertebrates. Registrants must provide own camping gear. Graded: S/U.

**Prerequisite(s):** MATH 121G, BIOL 465 or equivalent (or concurrent enrollment) or consent of instructor.

**BIOL 467. Evolution****3 Credits**

Covers theory, historical background, population variation, natural selection, adaptation, speciation.

**Prerequisite(s):** BIOL 111G, BIOL 305 or GENE 320, and MATH 121G.

**BIOL 469. Biology of Emerging Infectious Diseases****3 Credits**

This class will investigate the evolutionary and ecological drivers of disease emergence. The effect of emerging diseases on human health will be addressed throughout the class, but the class will also consider the consequences of disease emergence for the health of wildlife and plant populations. Additionally, the class will consider the mechanisms used to control disease emergence and why they succeed or fail.

**Prerequisite(s):** MATH 121G, Introductory Genetics (BIOL 305 or equivalent) or consent of the instructor.

**BIOL 470. Developmental Biology****3 Credits**

The purpose of this course is to introduce students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and, how changes in development provide the material basis for evolutionary change.

**Prerequisite(s):** BIOL 211G, BIOL 305, and MATH 121G.

**BIOL 472. Primate Behavior and Ecology****3 Credits**

Survey of the social behavior and ecology of nonhuman primates. Crosslisted with: ANTH 472.

**BIOL 473. Ecology of Microorganisms****3 Credits (2+3P)**

The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes.

**Prerequisite(s):** MATH 121G, BIOL 311 or consent of instructor.

**BIOL 474. Immunology****3 Credits**

Basic concepts of the immune response.

**Prerequisite(s):** MATH 121G, BIOL 305, and CHEM 211 or CHEM 313.

**BIOL 475. Virology****3 Credits**

Mechanisms of viral infections of animals and man. BCHE 395 or BIOL 305 are recommended.

**Prerequisite(s):** BIOL 311 and MATH 121G.

**BIOL 476. Soil Microbiology****3 Credits**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation, and other environmental problems as influenced by soil microorganisms. SOIL 252 and BIOL 311 recommended. Same as SOIL 476.

**BIOL 476 L. Soil Microbiology Laboratory****1 Credit**

Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as SOIL 476L.

**Prerequisite(s)/Corequisite(s):** BIOL 476.

**BIOL 477. Applied and Environmental Microbiology****4 Credits**

A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology.

**Prerequisite(s):** MATH 121G, BIOL 311, and 311 L, or consent of instructor.

**BIOL 478. Molecular Biology of Microorganisms****3 Credits**

The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. BIOL 305 and BCHE 395 recommended.

**Prerequisite(s):** BIOL 311 and MATH 121G.

**BIOL 479. Medical Microbiology****3 Credits**

An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease.

**Prerequisite(s):** MATH 121G and BIOL 311 required, BIOL 474 recommended.

**BIOL 479 L. Medical Microbiology Laboratory****1 Credit**

Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** BIOL 479. **Prerequisite(s):** MATH 121G, BIOL 311, BIOL 311L.

**BIOL 480. Animal Behavior****3 Credits**

A survey of the field of animal behavior. BIOL 322 recommended.

**Prerequisite(s):** MATH 121G, BIOL 111G, and junior-level standing.

**BIOL 484. Animal Communication****3 Credits**

An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products.

**Prerequisite(s):** BIOL 111G or consent of instructor, and MATH 121G.

**BIOL 485. Comparative Stress Physiology****3 Credits**

This course explores the biochemical, hormonal, and molecular aspects of stress physiology in all organisms from bacteria to humans. Focus area include hormesis, temperature, radiation, oxygen, infection, and dehydration.

**Prerequisite(s):** MATH 121 and BIOL 211G.

**BIOL 488. Principles of Conservation Genetics****3 Credits**

Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations.

**Prerequisite(s):** MATH 121G and BIOL 305.

**BIOL 489. Genetic Aspects of Population Biology****3 Credits**

Basic theory of population genetics and how that theory has guided, and been influenced by, studies of natural populations.

**Prerequisite(s):** MATH 121G and BIOL 305 or equivalent.

**BIOL 490. Neurobiology****3 Credits**

Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems.

**Prerequisite(s):** BIOL 211, MATH 142G or equivalent.

**BIOL 498. Biology Research Programs****1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

**BIOL 503 L. Advanced Primate Adaptation and Evolution Laboratory****1 Credit**

Laboratory with exercises on non-human primate adaptation and evolution. Crosslisted with: ANTH 573 L.

**Corequisite(s):** BIOL 503.

**BIOL 510. Current Topics in Biology****3 Credits**

Introduction to diverse topics in modern biology, including dynamic areas of current research.

**BIOL 514. Plant Physiology****2 Credits**

Same as EPWS 514.

**Prerequisites:** BIOL 211G and CHEM 112G.

**BIOL 520. Molecular Cell Biology****3 Credits**

An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature.

**Prerequisite:** BIOL 377 or equivalent.

**BIOL 527. Symbiosis****3 Credits**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems.

**Prerequisite:** graduate status.

**BIOL 533. Environmental Physiology of Plants****3 Credits**

Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Same as AGRO 533 and HORT 533.

**Prerequisite:** BIOL 314 or consent of instructor.

**BIOL 534. Advanced Human Evolution****3 Credits**

Advanced overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. Crosslisted with: ANTH 534.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** ANTH 534L when offered.

**BIOL 536. Advanced Disease Vector Biology****3 Credits**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Taught with: BIOL 436.

**Prerequisite(s):** BIOL 211G and BIOL 305.

**BIOL 540. Science and Ethics****1-3 Credits (1-3)**

Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated up to 4 credits. Crosslisted with: PHIL 540.

**BIOL 541. Professional Development Seminar****1-3 Credits**

Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc.

**Prerequisite:** consent of instructor.

**BIOL 545. Molecular and Biochemical Genetics****3 Credits**

Same as BCHE 545.

**BIOL 550. Special Topics****1-3 Credits**

Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic entomology, or parasitism in animals. May be repeated for unlimited credit.

**Prerequisite:** consent of instructor, and designation of a specific topic before registration.

**BIOL 562. Advanced Genomics Technology****3 Credits**

This course covers current genomics techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. Consent of Instructor required.

**BIOL 566. Advanced Bioinformatics and NCBI Database****3 Credits**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study. Consent of Instructor required.

**BIOL 568. Communities and Ecosystems****3 Credits**

Community ecology is an interdisciplinary field that integrates numerous theories, concepts, and methods to study the patterns and dynamics of biotic assemblages. Because biotic groups affect the biogeophysical and biogeochemical processes that govern Earth system functioning, community ecology also plays an increasingly large role in the study of ecosystem ecology, a discipline which seeks to understand the processes governing nutrient and energy flow across the Earth system. This course will explore the theories and methods for study of biodiversity, biogeography, and community assembly, as well as the pathways through which communities exert influence on ecosystem functioning. Topics will also include evolutionary influences on communities, the integration of community ecology into conservation and land management, and community ecology in an era of rapid environmental change.

**BIOL 571. Advanced Molecular and Cellular Mycology****3 Credits**

Exploration of the world of fungi with emphasis on fungal molecular biology and development, including discussion of fungal taxonomy and genomics, using current literature. Consent of instructor required.

**BIOL 572. Advanced Primate Behavior and Ecology****3 Credits**

Advanced review of non-human primate social behavior and ecology. Crosslisted with: ANTH 572.

**BIOL 573. Fungal Biology****3 Credits (3+2P)**

Same as EPWS 572.

**Prerequisites:** EPWS 310 or BIOL 311, or consent of instructor.

**BIOL 574. Advanced Human Osteology****3 Credits**

Advanced human osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Crosslisted with: ANTH 574.

**Corequisite(s):** BIOL 574L when offered.

**BIOL 574 L. Human Osteology Laboratory****1 Credit**

Laboratory for BIOL 574. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: ANTH 574 L.

**Corequisite(s):** BIOL 574.

**BIOL 577. Advanced Topics in Environmental Microbiology****3 Credits**

This course is based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA and the human microbiome.

**Prerequisite(s):** Consent of instructor.

**BIOL 581. Physiology of Animals****3 Credits**

Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. BIOL 111G, BIOL 377 recommended.

**Prerequisite:** BIOL 211G.

**BIOL 582. Advanced Plant Signalling and Development****3 Credits**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 305 or GENE 315, and MATH 121G.

**BIOL 587. Behavioral and Evolutionary Ecology****3 Credits**

This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.

**BIOL 589. Speciation and Adaptation****3 Credits**

Examination of the two great themes of evolutionary biology. Begins with an historical overview of perspectives on these evolutionary processes, and then moves through the foundations of modern research to focus on recent advances driven by improvements in theory and technology. Emphasis on synthesis of the primary literature through lectures, discussion, and written assignments.

**BIOL 590. Neuroscience****1-3 Credits**

Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. May be repeated up to 9 credits.

**BIOL 598. Special Research Programs****1-9 Credits**

Individual investigations either analytical or experimental.

**BIOL 599. Master's Thesis****15 Credits**

Thesis.

**BIOL 600. Doctoral Research****1-15 Credits**

Research.

**BIOL 610. Seminar****1-3 Credits (1-3)**

Oral presentation and discussion of journal articles and ongoing research projects. May be repeated up to 6 credits. S/U Grading (S/U, Audit).

**BIOL 612. Microbiology Seminar****1 Credit**

Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.

**BIOL 697. University Teaching Experience****1-3 Credits**

Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

**BIOL 698. Selected Topics****1-3 Credits**

Selected topics for doctoral students.

**BIOL 700. Doctoral Dissertation****15 Credits**

Dissertation.

## Genetics Courses

**GENE 110. Experimental Systems in Genetics****1 Credit**

Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.

**GENE 303V. Genetics and Society****3 Credits**

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: AGRO303V.

**GENE 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, ANSC 305, BIOL 305 and HORT 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**GENE 305 L. Genetic Techniques****1 Credit**

Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics. Pre/

**Corequisite(s):** GENE 315, or AGRO/ANSC/BIOL/HORT 305.

**GENE 315. Molecular Genetics****3 Credits**

Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics.

**Prerequisite(s)/Corequisite(s):** . Prerequisite(s): CHEM 112 and BIOL 211. Recommend CHEM 313.

**GENE 320. Hereditary and Population Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.

**Prerequisite(s):** CHEM 111G & BIOL 211G.

**GENE 391. Genetics Laboratory****1-6 Credits (1-6)**

Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**GENE 440. Genetics Seminar****1 Credit**

Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology. Consent of instructor required.

**Prerequisite(s):** Seniors only; GENE 315 & GENE 320.

**GENE 449. Special Problems****1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

**GENE 450. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

**GENE 452. Applied Bioinformatics****3 Credits**

Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.

**GENE 486. Genes and Genomes****3 Credits**

Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

**GENE 488. Gene Regulation****3 Credits**

Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315.

**Name:** Biology Department

**Office Location:** Foster Hall room 275

**Phone:** (575) 646-3611

**Website:** <http://bio.nmsu.edu/>

## Biology - Bachelor of Arts

The Bachelor of Arts curriculum is intended for students who desire a broad education with emphasis in biology in a program chosen by the student in consultation with an academic advisor. The Bachelor of Arts is recommended for those who plan to teach at the primary levels or to use a background in life science in business or other endeavors.

### Requirements

<b>General Education Requirements</b>	35
<b>Viewing a Wider World</b>	6
<b>Nondepartmental Requirements</b>	
CHEM 111G General Chemistry I	4
CHEM 112G General Chemistry II	4
MATH 142G Calculus for the Biological and Management Sciences	3-4
or MATH 191G Calculus and Analytic Geometry I	
<i>Organic Chemistry Requirement</i>	4-8
CHEM 211 Organic Chemistry	

OR

CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
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Select 3-4 credits from one of the following departments: astronomy, computer science, geology or physics 3-4

**Departmental Requirements**

BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 377	Cell Biology	3
BIOL 467	Evolution	3

Select sufficient upper-division biology electives to bring total upper-division credits to 24. <sup>1</sup> 12

**Electives** 29

Selective sufficient electives to bring the total to 120, including at least 48 upper-division credits.

**Second Language Requirement (required-see below)**

Total Credits 120-126

<sup>1</sup> Choice of electives should be done in consultation with an advisor.

### Second Language Requirement

For the Bachelor of Arts in the Biology there is a one year second language requirement, the student must do one of the following:

**Option 1:**

**Complete two semesters from the following:**

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

*For Heritage Learners:*

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

**Option 2:**

**Complete two semesters of American Sign Language (with a C- or better):**

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

**Option 3:**

**Challenge the 112 level for the following courses:**

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	

OR

**Challenge the 213 level for the following courses:**

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Biology - Bachelor of Science

The major in biology provides a solid academic base for those planning to enter any of the various fields of the biological sciences. The program allows considerable latitude. Suggested course sequences for specific areas of interest within biology can be obtained from the Biology Success Center (<http://bio.nmsu.edu/success>).

## Requirements

**Nondepartmental Requirements**

CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
<i>Organic Chemistry Requirement</i>		4-8

CHEM 211 Organic Chemistry

OR

CHEM 313 Organic Chemistry I  
& CHEM 314 and Organic Chemistry II  
& CHEM 315 and Organic Chemistry Laboratory

BCHE 341	Survey of Biochemistry	3-4
or BCHE 395	Biochemistry I	

BIOL 455	Biometry (preferred)	3
or A ST 311	Statistical Applications	

MATH 191G	Calculus and Analytic Geometry I	4
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PHYS 211G	General Physics I	3
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or PHYS 221G General Physics for Life Sciences I

PHYS 212G	General Physics II	3
or PHYS 222G	General Physics for Life Sciences II	

PHYS 211GL	General Physics I Laboratory	1
or PHYS 221GL	Laboratory to General Physics for Life Science I	

PHYS 212GL	General Physics II Laboratory	1
or PHYS 222GL	Laboratory to General Physics for Life Sciences II	

**Departmental Requirements**

BIOL 111G	Natural History of Life	3
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BIOL 111GL	Natural History of Life Laboratory	1
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BIOL 211G	Cellular and Organismal Biology	3
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BIOL 211GL	Cellular and Organismal Biology Laboratory	1
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BIOL 301	Principles of Ecology	3
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BIOL 305	Principles of Genetics	3
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BIOL 377	Cell Biology	3
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BIOL 467	Evolution	3
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Select sufficient upper-division biology electives to bring total upper-division credits to 28. <sup>1</sup>		16
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<b>General Education Requirements</b>		35
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<b>Viewing a Wider World</b>		6
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<b>Electives</b>		13
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Select sufficient electives to bring the total to 120 credits, including at least 48 upper-division credits.

**Second Language Requirement (required-see below):**

Total Credits	120-125
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<sup>1</sup> At least one upper-division course must include laboratory and/or field experience. The laboratory/field requirement can be satisfied by any BIOL course above the 300 level that includes a laboratory or a field trip—including BIOL 350 Special Topics or BIOL 450 Special Topics.

## Second Language Requirement

For the Bachelor of Science in the Biology there is a one year second language requirement, the student must do one of the following:

**Option 1:****Complete two semesters from the following:**

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

**For Heritage Learners:**

SPAN 213	Spanish for Heritage Learners II	3
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or SPAN 214 Spanish for Heritage Learners III

or PORT 213 Portuguese for Romance Language Students I

or PORT 214 Portuguese for Romance Language Students II

**Option 2:**

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

**Option 3:**

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	
OR		

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Conservation Ecology - Bachelor in Conservation Ecology

Co-directors of the Program:

**Professor, Michelle Nishiguchi**, Department Head, Biology  
**Professor, Kathryn Stoner**, Department Head, Fish, Wildlife and Conservation Ecology

**Professors** Boeing, Boecklen, Caldwell, Cowley, Desmond, Hanley, Houde, Milligan, Nishiguchi, Roemer, G. Smith, Wright; **Associate Professors** Bailey, Cain, Mabry; **Assistant Professors** Ferrenberg, James

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of our Earth's natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability

and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from the Biology; Fish, Wildlife and Conservation Ecology; Geography; and Range Science departments.

The educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The requirements are listed below. In addition, each required course must be passed with a grade of C- or better.

**Core Curriculum**<sup>1</sup>

A ST 311	Statistical Applications	3
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
CHEM 211	Organic Chemistry	4
ENGL 111G	Rhetoric and Composition	4
ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	
Select one from the following:		3
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
HON 265G	Principles of Human Communication Honors	
Select one from the following:		3
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
Select one from the following:		6-12
MATH 121G & MATH 142G	College Algebra and Calculus for the Biological and Management Sciences	
OR		
MATH 190G & MATH 191G & MATH 192G	Trigonometry and Precalculus and Calculus and Analytic Geometry I and Calculus and Analytic Geometry II	
PHYS 211G	General Physics I	3
or PHYS 221G	General Physics for Life Sciences I	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 221GL	Laboratory to General Physics for Life Science I	

PHYS 212G	General Physics II	3
or PHYS 222G	General Physics for Life Sciences II	
PHYS 212GL	General Physics II Laboratory	1
or PHYS 222GL	Laboratory to General Physics for Life Sciences II	

**Viewing a Wider World**

Select one Viewing a Wider World course<sup>2</sup> 3

**Major Requirements**

BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 305	Principles of Genetics	3
or AGRO 305	Principles of Genetics	
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
BIOL 322	Zoology	3
BIOL 462	Conservation Biology	3
BIOL 467	Evolution	3
BIOL 488	Principles of Conservation Genetics	3
FWCE 110G	Introduction to Natural Resources Management	4
FWCE 255	Principles of Fish and Wildlife Management	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	4

*Physiology*

Select 3-4 credits from the following: 3-4

ANSC 370	Anatomy and Physiology of Farm Animals
BIOL 314	Plant Physiology
BIOL 381	Animal Physiology
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology
FWCE 432	Environmental Biology of Fishes

*Requirements in Diversity of Life*

Select 6-8 credits from the following: 6-8

BIOL 408	Ecology of Plants
BIOL 465	Invertebrate Zoology
BIOL 480	Animal Behavior
EPWS 303	Economic Entomology
EPWS 462	Parasitology
FWCE 431	Mammalogy
FWCE 467	Herpetology
FWCE 482	Ichthyology

**Additional Courses**

Select additional electives to bring total to 120 credits including 48 upper division credits. 12

**Other Related Courses**

BCHE 341	Survey of Biochemistry
BIOL 436	Disease Vector Biology
BIOL 442	Genomics Technology
BIOL 446	Bioinformatics and NCBI Database
BIOL 469	Biology of Emerging Infectious Diseases
BIOL 489	Genetic Aspects of Population Biology
GEOG 381	Cartography and Geographic Information Systems
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)
GEOL 111G	Introductory Geology
GEOL 424	Soil Chemistry
GOVT 378	U.S.-Mexico Border Politics
RGSC 318	Watershed Management
RGSC 325	Rangeland Restoration Ecology
RGSC 452	Vegetation Measurements for Rangeland Assessment

**Second Language Requirement: (not required)**

Total Credits 120-129

<sup>1</sup> Includes University and College Requirements 67-68 credits

<sup>2</sup> One VWW course will be satisfied using the 9-hour rule: students with Biology as home department use FWCE courses and students with Fish, Wildlife and Conservation Ecology as home department use BIOL courses.

**Second Language Requirement**

For the Bachelor in Conservation Ecology with a major in Conservation Ecology there is no second language requirement for the degree.

## Genetics and Biotechnology - Bachelor of Science in Genetics

**Codirectors of the Program:**

**Professor**, Michelle Nishiguchi, Department Head, Biology

**Associate Professor**, Rolston St. Hilaire, Interim Department Head, Plant and Environmental Sciences

**Professors** Bosland, Cramer, Houde, Milligan, Nishiguchi, O'Connell, Ray, Sengupta-Gopalan, C. Shuster, St. Hilaire; **Associate Professors** Bailey, Curtiss, M. Shuster, Zhang

Have you ever wondered why your hair or eye color, facial features, or the build of your body resembles that of your parents, grandparents, or other close relatives? What factors are responsible for generating all the variety of colors and shapes of flowers, trees, and different types of animals? If these questions have crossed your mind, then you have been thinking about Genetics; the science of heredity. Genetics is studied at the DNA/ gene/genome level (molecular genetics, biotechnology, genomics and bioinformatics), the level of organisms (classical or Mendelian genetics), and within/among populations of individuals (population and quantitative genetics).

One of the most significant scientific accomplishments in history has been the use of genomic technologies to recently identify most human genes, as well as, most genes for a number of other animals, plants, fungi, and bacteria. Geneticists now have tremendous opportunities to use molecular, biochemical, mathematical, and computer science-based (bioinformatics) approaches to investigate how these genes determine observable traits. This information can be used to significantly advance human health and well being, and to meet the food and fiber needs of the world.

A degree in Genetics can provide excellent preparation for careers in academic research and technical support, teaching, agriculture, the biotechnology industry, medicine and health sciences, forensic science, technical writing, and sales or marketing. It is also an excellent background for students wishing to enter a graduate program, medical school, and veterinary school.

Undergraduates in the Genetics program must earn a grade of C- or better to receive credit for required Basic Science Background and Genetics Core courses. Within the Genetics Core curriculum, Tier I courses must be taken by all majors, for a total of 28 credit hours. To accommodate differing interests among students, a series of Tier II courses comprising 11 to 13 credits are provided. Ethical considerations of genetic based technologies will be infused throughout the curriculum, with a focused course on Science and Ethics in the Tier III portion of the core curriculum.

## Requirements

### General Education Requirements

#### Area I: Communications

English Composition-Level 1. Select one from the following: 4

ENGL 111G Rhetoric and Composition

ENGL 111GH Rhetoric and Composition Honors

ENGL 111 M Rhetoric and Composition for International and Multilingual Students

English Composition-Level 2:

ENGL 218G Technical and Scientific Communication 3  
or ENGL 318G Advanced Technical and Professional Communication

Oral Communication. Select one from the following: 3

AXED 201G Effective Leadership and Communication in Agricultural Organizations

COMM 253G Public Speaking

COMM 265G Principles of Human Communication

HON 265G Principles of Human Communication Honors

#### Area II: Mathematics/Algebra

MATH 191G Calculus and Analytic Geometry I 4

#### Area III: Laboratory Science

CHEM 111G General Chemistry I 4

CHEM 112G General Chemistry II 4

#### Area IV & V: Social/Behavioral Sciences and Humanities and Fine Arts

Select a total of 15 credits combined from Areas IV and V, with 6 credits in one area and 9 credits in the other area: <sup>1</sup> 15

Area IV: Social/Behavioral Sciences: Select 6-9 credits <sup>a</sup>

Area V: Humanities and Fine Arts: Select 6-9 credits <sup>1</sup>

### Viewing a Wider World

Select one Viewing a Wider World course <sup>2</sup> 3

### Basic Science Background Requirements

A ST 311 Statistical Applications 3  
or BIOL 455 Biometry

BCHE 395 Biochemistry I 3

BCHE 396 Biochemistry II 3

BIOL 111G Natural History of Life 3

CHEM 111G General Chemistry I 4  
or CHEM 115 Principles of Chemistry I

CHEM 112G General Chemistry II 4  
or CHEM 116 Principles of Chemistry II

CHEM 313 Organic Chemistry I 3

CHEM 314 Organic Chemistry II 3

CHEM 315 Organic Chemistry Laboratory 2

MATH 191G Calculus and Analytic Geometry I 4

MATH 192G Calculus and Analytic Geometry II 4

PHYS 211G General Physics I 3

or PHYS 221G General Physics for Life Sciences I

PHYS 212G General Physics II 3

or PHYS 222G General Physics for Life Sciences II

### Core Requirements

#### Tier I Courses

GENE 110 Experimental Systems in Genetics 1

BIOL 211G Cellular and Organismal Biology 3

BIOL 211GL Cellular and Organismal Biology Laboratory 1

BIOL 311 General Microbiology 3

BIOL 311 L General Microbiology Laboratory 2

GENE 305 L Genetic Techniques 1

GENE 315 Molecular Genetics 3

GENE 320 Hereditary and Population Genetics 3

BIOL 377 Cell Biology 3

GENE 440 Genetics Seminar 1

GENE 452 Applied Bioinformatics 3

or BIOL 446 Bioinformatics and NCBI Database

BCHE 494 Biochemical Genetics Laboratory 3

or BIOL 302 Molecular Biology Techniques Laboratory

#### Tier II Courses

Select one course from each of the following four areas: 12-14

Selection response:

AGRO 462 Plant Breeding

ANSC 423 Animal Breeding

BIOL 467 Evolution

Physiology:

ANSC 421 Physiology of Reproduction

BIOL 354 Physiology of Humans

BIOL 381 Animal Physiology

BIOL 385 An Introduction to Cancer

BIOL 451 Physiology of Microorganisms

BIOL 474 Immunology

EPWS 314 Plant Physiology

HORT 471 Plant Mineral Nutrition

<b>Organism Structure:</b>	
ANSC 370	Anatomy and Physiology of Farm Animals
BIOL 313	Structure and Function of Plants
BIOL 322	Zoology
BIOL 382	Plant Signalling and Development
BIOL 470	Developmental Biology
BIOL 465	Invertebrate Zoology
EPWS 303	Economic Entomology
<b>Molecular Genetics:</b>	
BIOL 475	Virology
BIOL 478	Molecular Biology of Microorganisms
GENE 486	Genes and Genomes
GENE 488	Gene Regulation
<i>Tier III Courses</i>	3
Select one from the following:	
AGRO 303V	Genetics and Society
HON 306V	Science, Ethics and Society
PHIL 321	Biomedical Ethics
<b>Additional Courses</b>	
Select electives to bring total to 120 credits including 48 upper division credits.	
<i>Recommended Electives (Honors College)</i>	
HON 400	Honors Thesis
Select 9 credits from the following:	
HON 205G	Life, Energy, and Evolution
HON 214	Successful Fellowship Writing
Select 6 credits from the following:	
HON 306V	Science, Ethics and Society
HON 314	Successful Fellowship Writing
HON 410	Honors Internship
<b>Second Language Requirement: (not required)</b>	
Total Credits	124-126

<sup>1</sup> Total of 15 credits combined between Areas IV and V, with 6 credits in one area and 9 credits in the other area. See General Education Courses (p. 46) for listing of available courses.

<sup>2</sup> One VWW area will be satisfied using the nine-hour rule. Students with Biology as their home department will use GENE courses and students with Plant and Environmental Science as their home department use BIOL courses.

## Second Language Requirement

For the Bachelor of Science in Genetics with a major in Genetics and Biotechnology there is no second language requirement for the degree.

# Microbiology - Bachelor of Science

The major in microbiology provides a solid academic base for those planning to enter any of the various fields of microbiology.

## Requirements

### Nondepartmental Requirements

CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4

CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
MATH 191G	Calculus and Analytic Geometry I	4
BIOL 455	Biometry (preferred)	3
or A ST 311	Statistical Applications	
PHYS 211G	General Physics I	3
or PHYS 221G	General Physics for Life Sciences I	
PHYS 212G	General Physics II	3
or PHYS 222G	General Physics for Life Sciences II	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 221GL	Laboratory to General Physics for Life Science I	
PHYS 212GL	General Physics II Laboratory	1
or PHYS 222GL	Laboratory to General Physics for Life Sciences II	

### Departmental Requirements

BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 305	Principles of Genetics	3
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 451	Physiology of Microorganisms	3
or BIOL 475	Virology	
BIOL 474	Immunology	3
BIOL 478	Molecular Biology of Microorganisms	3
BIOL 479	Medical Microbiology	3
BIOL 479 L	Medical Microbiology Laboratory	1

Select six additional credits related to microbiology numbered 300 or above to bring total upper-division credits in microbiology to 24 from the following:

BIOL 412	Seminar in Microbiology	
BIOL 427	Symbiosis	
BIOL 451	Physiology of Microorganisms	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 473	Ecology of Microorganisms	
BIOL 475	Virology	
BIOL 476	Soil Microbiology	
BIOL 477	Applied and Environmental Microbiology	

**General Education Requirements** 35

**Viewing a Wider World** 6

**Electives** 10

Select sufficient electives to bring total credits to 120 including 48 upper-division credits.

### Second Language Requirement: (required-see below)

Total Credits 120

## Second Language Requirement

For the Bachelor of Science in the Biology there is a one year second language requirement, the student must do one of the following:

**Option 1:**

Complete two semesters from the following:

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

For Heritage Learners:

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

**Option 2:**

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

**Option 3:**

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	
OR		

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

**Option 4:**

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

## Biology - Undergraduate Minor

The courses of the Biology minor represent core biological content, critical for a general view of biology. A student cannot earn a bachelor's degree in Biology and also earn a minor in Biology.

### Requirements

A minor in Biology must include 20 credits in Biology, of which at least 9 credits must be numbered 300 and above.

No more than 3 credits of special topics or individual study courses may be applied to the minor. A grade of C- or better must be earned in all courses.

**Required Courses**

BIOL 111G	Natural History of Life	3
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BIOL 111GL	Natural History of Life Laboratory	1
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 301	Principles of Ecology	3
or BIOL 377	Cell Biology	
BIOL 305	Principles of Genetics	3
BIOL 467	Evolution	3
<b>Elective</b>		3
Select any Biology courses to bring the total credits to 20.		
Total Credits		20

## Conservation Ecology - Undergraduate Minor

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. A minor in Conservation Ecology must include a minimum of 20 credits in the discipline with 9 of these coming from upper-division courses.

### Requirements

**Core Curriculum**

BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 462	Conservation Biology	3
FWCE 255	Principles of Fish and Wildlife Management	3
FWCE 402	Seminar in Natural Resource Management	1
Select 6 credits from the following:		6

BIOL 312	Plant Taxonomy	
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	
BIOL 322	Zoology	
BIOL 408	Ecology of Plants	
BIOL 465	Invertebrate Zoology	
BIOL 467	Evolution	
BIOL 480	Animal Behavior	
BIOL 488	Principles of Conservation Genetics	
ECON 384V	Water Resource Economics	
ECON 337V	Natural Resource Economics	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 330	Natural History of the Vertebrates	
FWCE 409	Introduction to Population Ecology	
FWCE 447	Wildlife Law and Policy	
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	

Total Credits		20
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## Genetics and Biotechnology - Undergraduate Minor

### Required Courses

GENE 110	Experimental Systems in Genetics	1
BIOL 111G	Natural History of Life	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
GENE 305 L	Genetic Techniques	1
GENE 452	Applied Bioinformatics	3
Select two from the following:		6
BIOL 305	Principles of Genetics	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
Total Credits		18

## Human Biology - Undergraduate Minor

The Human Biology minor is intended to provide academic recognition for students who wish to focus a significant amount of attention on courses that deal with human beings from a wide variety of biological standpoints. Thus, course work may encompass topics representing a range of viewpoints such as biological function, human ecology, human origins, and psychology. Successful completion of this minor will provide students with a valuable interdisciplinary perspective on the human condition. This program consists of a minimum of 18 hours, that includes a minimum of 12 from within the Biology Department and a minimum of 3 outside the department. Successful completion of the minor will be certified by the Biology Department. A grade of C- or better is required of all minor courses.

### Requirements

#### Required Departmental Courses

BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
Select 3-4 credits from the following: <sup>1</sup>		3-4
BIOL 254	Human Physiology	
BIOL 353	Pre-Professional Human Anatomy	
BIOL 354	Physiology of Humans	

#### Additional Courses

Select sufficient credits to total 18 credits from within and outside Biology department: 11

#### Within Department

Select a minimum of 5 credits from the following:

BIOL 101G	Human Biology
BIOL 305	Principles of Genetics
BIOL 353 L	Pre-Professional Human Anatomy Laboratory
BIOL 354 L	Laboratory of Human Physiology
BIOL 385	An Introduction to Cancer
BIOL 424	Human Osteology

BIOL 424 L	Human Osteology Lab
BIOL 434	Human Evolution
BIOL 434 L	Human Evolution Laboratory
BIOL 469	Biology of Emerging Infectious Diseases
BIOL 470	Developmental Biology
BIOL 474	Immunology
BIOL 490	Neurobiology

#### Outside Department

Select a minimum of 3 credits; maximum 6 credits from the following:

ANTH 130G	Human's Place in Nature: Introduction to Biological Anthropology
ANTH 130GL	Human's Place in Nature Laboratory
ANTH 355	Physical Anthropology
ANTH 357V	Medical Anthropology
HON 232G	The Human Mind
HON 306V	Science, Ethics and Society
PHLS 301V	Human Sexuality
PSY 375	Psychology and the Brain

Total Credits 18-19

<sup>1</sup> Any of BIOL 254 Human Physiology, BIOL 353 Pre-Professional Human Anatomy, or BIOL 354 Physiology of Humans not taken as a departmental requirement can be taken as one of the departmental elective courses.

## Microbiology - Undergraduate Minor

A student cannot earn a bachelor's degree in Microbiology and also earn a minor in Microbiology.

### Requirements

#### Required Courses

BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BCHE 341	Survey of Biochemistry	4
or BCHE 395	Biochemistry I	
Select at least 11 credits from the following:		11
BIOL 412	Seminar in Microbiology	
BIOL 451	Physiology of Microorganisms	
BIOL 473	Ecology of Microorganisms	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 479	Medical Microbiology	
BIOL 479 L	Medical Microbiology Laboratory	

Total Credits 20

## Biology - Master of Science

The Master of Science degree can be obtained through either a thesis option or a non-thesis option. Both options require 30 credits of course work. The non-thesis option can be completed as an accelerated (one-year) program concentrating in biotechnology or through an individual

degree plan in consultation with the student's Master of Science committee.

There are three formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are

#### Course Requirements

BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3
BIOL 610	Seminar	1-3

Students are required to successfully complete the Seminar course once each year that they are in the program.

For research toward the Master of Science degree, students can choose among the Department's three areas of emphasis:

#### 1. Behavioral, Ecological and Evolutionary Biology

The Behavioral, Ecological and Evolutionary Biology program is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the behavior, ecology, and evolution of living and extinct taxa.

#### 2. Cell and Organismal Biology

The Cell and Organismal Biology program is appropriate for all Graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms.

#### 3. Microbiology

The Microbiology curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and protists) such as their physiology, ecology, development or evolution.

All graduate students should develop their curriculum plan in consultation with the faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website <http://bio.nmsu.edu/grads/>.

Graduate students may also earn a minor in other graduate departments and programs.

## Biotechnology Program

This is an accelerated (one year) non-thesis Master of Science degree in Biology that focuses on biotechnology. The program requires 30 hours of course work. The courses in this program are designed to prepare students for biotechnology-related careers in basic and applied research; in product development and testing; and in policy-making, regulation and law enforcement. The program of study includes practical training in molecular biology, genomics and bioinformatics, statistical analysis, business, bioethics and professional development skills. Additional graduate course work will provide students with further expertise in their individual areas of interest, including cell, molecular, and microbial biology; environmental, ecological and evolutionary biology; and general and integrative biology. Students who complete this training will be prepared for successful employment in academic, corporate, and government settings.

#### Skills 9-10

BIOL 450	Special Topics (Molecular Biology Techniques Lab)
BIOL 566	Advanced Bioinformatics and NCBI Database
or GENE 452	Applied Bioinformatics
BIOL 562	Advanced Genomics Technology
A ST 505	Statistical Inference I
<b>Professional Development 5-7</b>	
BIOL 540	Science and Ethics
BIOL 541	Professional Development Seminar
MGT 591	Seminar in Entrepreneurship (or approved substitute)

#### Biological Knowledge Electives<sup>1</sup> 14-16

#### Optional Internship<sup>2</sup> 3-6

<sup>1</sup> Students are expected to choose 5 or more courses numbered 450 or above in microbiology, organismal and cellular biology, genetics, or ecology.

<sup>2</sup> This may include a research internship in a biotechnology company or in a Biology Department laboratory. Credits earned during an internship count towards the required elective credits.

## Biology - Doctor of Philosophy

The Department of Biology offers graduate study leading to the Doctor of Philosophy degree. Our goal is to prepare students for careers in the various fields in biology through formal coursework and research experiences as well as through seminars and discussion groups.

There are three formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are:

#### Course Requirements

BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3
BIOL 610	Seminar	1-3

Students are required to successfully complete the Seminar course once each year that they are in the program.

Doctor of Philosophy students can choose among the Department's three areas of emphasis:

#### 1. Behavioral, Ecological and Evolutionary Biology

The Behavioral, Ecological and Evolutionary Biology program is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the behavior, ecology, and evolution of living and extinct taxa.

#### 2. Cell and Organismal Biology

The Cell and Organismal Biology program is appropriate for all Graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms.

#### 3. Microbiology

The Microbiology curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and

protists) such as their physiology, ecology, development or evolution.

All graduate students should develop their curriculum plan in consultation with their faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website <http://bio.nmsu.edu/grads/>.

Graduate students may also earn a minor in other graduate departments and programs.

## Chemistry and Biochemistry Undergraduate Program Information

A degree in chemistry or biochemistry enables a student to pursue a wide variety of careers in: research, production, sales, management and teaching. These degrees are also an excellent preparation for professional studies in medicine, dentistry, forensics, veterinary science, optometry, pharmacology, pharmacy and law.

Chemistry majors who have completed the requirements for the Bachelor of Science degree may receive American Chemical Society certification if they take one additional one-semester course which includes 1 credit of laboratory.

Students who complete a Bachelor of Science in Biochemistry and wish to complete the Bachelor of Arts in Chemistry must complete 3 additional upper division chemistry credits that are not counted in the Bachelor of Science in Biochemistry.

All departmental and nondepartmental requirements may not be taken S/ U and must earn a C- or better final grade.

This department does not have a foreign language requirement for any of its degrees.

## Graduate Program Information

The Department of Chemistry and Biochemistry offers programs leading to the MS and Ph.D. degrees in the areas of physical, organic, inorganic, biological, and analytical chemistry. Admission to these programs without deficiency is based on an undergraduate program essentially equivalent to that pursued by a chemistry or biochemistry major at this university. An entering student is encouraged to take the Graduate Record Examination (aptitude) to increase his or her chances for financial support. All foreign students must take GRE and TOEFL and must demonstrate adequate English speaking and writing skills.

Students who wish may take a minor in chemical toxicology or molecular biology. The core course work required of students entering with no previous graduate study in chemistry or biochemistry consists of basic core courses completed in one of the following options:

1. two courses chosen respectively from two of the five major areas represented in the department apart from a student's elected field of thesis research; or
2. one course chosen from the five major areas apart from the student's elected field of thesis research plus one graduate-level course in a discipline outside the Department of Chemistry and Biochemistry.

A master's candidate will plan an appropriate program of further study with his or her advisor and is also required to prepare a thesis. The

thesis requirement may be waived upon application to the department head, after completion of the doctoral comprehensive examination requirements. A chemistry student who successfully completes the Ph.D. qualifying examination will begin writing the cumulative examinations, which constitute the written portion of the comprehensive examination. A biochemistry student who successfully completes the Ph.D. qualifying examination will begin preparation of a research proposal which will be orally defended for completion of the comprehensive examination. After completion of the qualifying exam, a doctoral committee is formed to assist the student in planning a program appropriate to his or her background and goals. Since research is central in both the master's and doctoral programs, the early selection of a research advisor is encouraged. The student is expected to participate in the colloquia and seminar programs. Financial support is available to graduate students in chemistry and biochemistry through numerous teaching and research assistantships as well as federally supported traineeships and fellowships. Inquiries regarding these opportunities should be directed to the head of the department.

## Degrees for the Department

Chemistry - Bachelor of Arts (p. 238)

Biochemistry - Bachelor of Science (p. 237)

Chemistry - Bachelor of Science (p. 238)

Chemistry - Master of Science (p. 240)

Chemistry - Doctor of Philosophy (p. 240)

## Minors for the Department

Environmental Chemistry - Undergraduate Minor (p. 239)

Biochemistry - Undergraduate Minor (p. 239)

Chemistry - Undergraduate Minor (p. 239)

**Professor William Quintana, Department Head**

**Professors** Arterburn, Gopalan, Herndon, Johnson, Quintana, Rayson, Smirnov, Zoski; **Associate Professors** Houston, Lara, Lusetto, Lyons, Maio; **Assistant Professors** Ashley, Li, Mera, Talipov, Yukl; **Adjunct Professors** Wollnik; **College Professors** Chinnasamy, Dunlavy, Potenza; **Emeritus Professor** Eiceman, Kuehn

*W. Quintana, Department Head, Ph.D. (Pennsylvania)– inorganic chemistry, boron chemistry, chemical education; J.B. Arterburn, Ph.D. (Arizona)– organic chemistry, synthetic medicinal and chemical biology; A. Ashley, Ph.D. (Colorado State University)– biochemistry, toxicology, cell culture, DNA/RNA isolation, genotyping; A. Gopalan, Ph.D. (Ohio State University)– organic chemistry: synthetic methods, applications of enzymes in asymmetric synthesis; J. W. Herndon, Ph.D. (Princeton)– organic chemistry; organo-transition metal complexes, synthesis of biologically important cyclic compounds; K. Houston, Ph.D. (University of Texas- MD Anderson)– biochemistry, molecular mechanisms of hormone action in tumorigenesis; M. D. Johnson, Ph.D. (New Mexico State University)– inorganic chemistry; kinetics, reaction mechanisms of transition metal complexes; A. S. Lara, Ph.D. (New Mexico State University)– analytical chemistry: exploitation of clays for remediation of environmental pollutants; F. Li, Ph.D. (Minnesota)– inorganic chemistry, bioinorganic chemistry, small molecule activation; S. L. Lusetto, Ph.D. (Wisconsin–Madison)– biochemistry: cell metabolism, disease etiology; B. A. Lyons, Ph.D. (Cornell University)– biochemistry: nmr spectroscopic studies of signal transduction pathways in breast cancer;*

W. A. Maio, Ph.D. (Johns Hopkins University)– organic chemistry, total synthesis of marine natural products and explorations of new chemical methods; synthesis of lactones and lactams, artemisinin- based antimalarial dimers, and total synthesis of (+)-iriomoteolide 1a; P. E. Mera, Ph. D. (Wisconsin–Madison)– Microbiology, cell - division cycle of bacteria, drug - resistant bacteria, DNA replication; G. D. Rayson, Ph.D. (Texas-Austin)– analytical chemistry: spectroscopy; S. N. Smirnov, Ph.D. (Novosibirsk State University)– physical chemistry: photo-induced charge separation; M. R. Talipov, Ph. D. (Bashkir State University)– Theoretical Physical Chemistry, electronic structure calculations, ab initio calculations, density functional theory calculations; E. T. Yukl, Ph.D. (Oregon Health and Science University)– biochemistry: x-ray crystallography and spectroscopy of bacterial metalloproteins; C. G. Zoski, Ph.D. (Queens University, Canada)– analytical chemistry: theoretical and experimental electrochemistry

## Biochemistry Courses

### BCHE 140. Introduction to Biochemistry

#### 1 Credit

A description of the nature of inquiry in biochemistry, especially with respect to the interaction of chemistry and biology. Both historical development and topics of current interest will be discussed. Graded S/U.

### BCHE 241. Introduction to Research in Biochemistry

#### 1-3 Credits

Techniques and procedures of biochemical research. May be repeated for a maximum of 3 credits.

**Prerequisites:** 8 credits of chemistry and 3.0 GPA in chemistry.

### BCHE 341. Survey of Biochemistry

#### 4 Credits (3+3P)

Basic principles of biochemical processes and the structure/function of the major classes of biomolecules, with introductions to metabolism and the central dogma of biochemistry. The chemical and biological properties of major biomolecules (DNA, proteins,

**Prerequisite(s):** C or better in CHEM 211 or CHEM 313.

### BCHE 395. Biochemistry I

#### 3 Credits

Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism.

**Prerequisite(s):** C or better in CHEM 314.

### BCHE 396. Biochemistry II

#### 3 Credits

Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 H.

**Prerequisite(s):** C or better in BCHE 395.

### BCHE 396 H. Biochemistry II Honors

#### 3 Credits

Taught with BCHE 396 with additional work required.

### BCHE 397. Experimental Biochemistry Laboratory

#### 3 Credits

Introduction to fundamental techniques used to explore structure and function of biological macromolecules such as proteins, carbohydrates, lipids, and nucleic acid. Course covers analyzing and reporting experimental data; enzymology; quantitative methods to determine biological molecules; basic principles of electrophoresis, chromatography, and spectroscopic immunochemistry.

**Prerequisite:** C or better in BCHE 395.

**Corequisite:** BCHE 396.

### BCHE 432. Physical Biochemistry

#### 3 Credits

This course focuses on modern Biophysical techniques used in protein and nucleic acid research. Topics are covered in some detail at the theoretical level. The course content is delivered entirely by podcast. Podcast contributions are from several different faculty from within their particular area(s) of expertise. Topics covered include (but are not limited to): biomolecular NMR, atomic force microscopy, light scattering, circular dichroism, ultracentrifugation, isothermal titration calorimetry, positron emission tomography, computerized tomography, ultrasound, functional MRI, protein fluorescence, mass spec/ proteomics, protein molecular dynamics simulations, and X-ray diffraction. Course credit qualifies for minor degree in chemistry as a physical-analytical chemistry emphasis. CHEM 431, or CHEM 433.

**Prerequisite:** One semester of undergraduate physical chemistry, e.g.

### BCHE 440. Biochemistry Seminar

#### 1 Credit

Introduction to current literature in biochemistry and molecular biology. Selected topics in the field will be presented by the faculty. Students will present written and oral reports from literature searches. Restricted to: BCHE majors.

**Prerequisite(s):** BCHE 395.

### BCHE 441. Advanced Research in Biochemistry

#### 1-3 Credits

Investigation of biochemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

**Prerequisites:** consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

### BCHE 446. Biochemistry III

#### 3 Credits

Intermediary metabolism of carbohydrates, lipids, amino acids, and nucleic acids. Metabolic pathways discussed with emphasis on biochemical regulation and mechanistic, structural, functional, and evolutionary basis for existence.

**Prerequisite(s):** BCHE 395 and either BCHE 396 or consent of instructor.

### BCHE 451. Special Topics

#### 1-3 Credits

Same as CHEM 451. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

### BCHE 455. Independent Studies

#### 1-3 Credits

Independent studies directed by consulting faculty.

**Prerequisite:** consent of instructor.

**BCHE 494. Biochemical Genetics Laboratory****3 Credits (1.25+6P)**

Laboratory techniques required for experimentation with recombinant DNA such as nucleic acid isolation and purification, polymerase chain reaction (PCR), sequence analysis, and directed mutagenesis using genetic material from both prokaryotic and eukaryotic organisms.

Consent of Instructor required.

**Prerequisite(s):** C or better in BCHE 395 and BCHE 396 or GENE 315, and consent of instructor.

**BCHE 540. Seminar in Biochemistry****1 Credit**

Formal seminar presentation in current topics in biochemical research. May be repeated for a maximum of 3 credits.

**BCHE 542. Biochemistry I****3 Credits**

Relationship between macromolecular structure and function. Basic enzymology. Energy metabolism.

**Prerequisite(s):** CHEM 314 and CHEM 431 or CHEM 433; or BCHE 395 or equivalent.

**BCHE 545. Molecular and Biochemical Genetics****3 Credits**

An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology. Same as BIOL 545.

**Prerequisite:** BCHE 542 or equivalent.

**BCHE 546. Biochemistry II****3 Credits**

Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation.

**Prerequisite:** BCHE 542 or BCHE 395 with consent of instructor.

**BCHE 590. Discussions in Biochemistry****1 Credit**

Current research problems in biochemistry. May be repeated for a maximum of 6 credits. S/U Grading (S/U, Audit).

**BCHE 598. Special Research Programs****1-3 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded S/U.

**BCHE 599. Master's Thesis****15 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 599.

**BCHE 600. Research****1-15 Credits**

May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.

**BCHE 647. Physical Biochemistry****3 Credits**

Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 451.

**Prerequisite(s):** 'C' or better in CHEM 431 or CHEM 433 or BCHE 542.

**BCHE 649. Topics in Biochemistry****1-3 Credits**

Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.

**BCHE 650. Advanced Seminar****1 Credit**

Discussion of biochemical research in progress that relates to a doctoral candidate's thesis research. Intended for students who have earned a master's degree or the equivalent and has made significant research progress for preparation of the doctoral dissertation. May be repeated for a maximum of 3 credits.

**BCHE 700. Doctoral Dissertation****20 Credits**

May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.

## Chemistry Courses

**CHEM 100. Basic Chemistry****3 Credits**

For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.

**Prerequisite:** Enhanced ACT composite score of at least 18 or a grade of C or better in CCDM 114 N.

**CHEM 101. General Supplemental Instruction I****1 Credit**

Collaborative workshop for students in General Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 111G.

**CHEM 102. General Supplemental Instruction II****1 Credit**

Collaborative workshop for students in General Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 112G.

**CHEM 103. Principles of Supplemental Instruction III****1 Credit**

Collaborative workshop for students in CHEM 110G, Principles and Applications of Chemistry. Course does not count toward departmental degree requirements. May be repeated for maximum of 2 credits.

**Co-requisite:** CHEM 110G.

**CHEM 110G. Principles and Applications of Chemistry****4 Credits (3+3P)**

A survey of the properties and uses of the elements and their compounds. In addition to classical chemistry, attention is paid to the materials from which consumer products are made, to the production of energy, and to environmental considerations.

**Prerequisite:** 3 years of high school math or CCDM 114N.

**CHEM 111G. General Chemistry I****4 Credits (3+3P)**

Descriptive and theoretical chemistry. CHEM 111G/112G are General Education alternative to CHEM 110G.

**Prerequisite:** (1) grade of C or better in MATH 120 or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 120; and (2) one of the following: B or better in a second semester high school chemistry course, or grade of at least C in CHEM 100, or an enhanced ACT score of at least 22.

**CHEM 112G. General Chemistry II****4 Credits (3+3P)**

Descriptive and theoretical chemistry. CHEM 111G/112G are General Education alternative to CHEM 110G.

**Prerequisite(s):** CHEM 111G.

**CHEM 115. Principles of Chemistry I****4 Credits (3+3P)**

Detailed introduction to analytical, inorganic and physical aspects of chemistry; both descriptive and theoretical explanations. Structured for chemistry and biochemistry majors but appropriate for other physical and life science students. CHEM 115/116 are General Education alternatives to CHEM 110G.

**Prerequisite:** Eligible to take MATH 190G and an ACT composite score of 22 or higher.

**CHEM 116. Principles of Chemistry II****4 Credits (3+3P)**

Recommended for chemistry majors and other qualified students. CHEM 115/116 are General Education alternatives to CHEM 110G.

**Prerequisites:** grade of C or better in CHEM 115.

**CHEM 210. Chemistry for the Allied Health Sciences****3 Credits**

Discussion and application of the established facts and concepts of general organic chemistry and biochemistry to acquire a molecular understanding of a variety of health related issues, from atmospheric ozone holes to human nutrition.

**Prerequisite:** CHEM 110G or CHEM 111G.

**CHEM 211. Organic Chemistry****4 Credits (3+3P)**

A one-semester survey for students requiring a brief coverage of important classes of organic compounds. May be repeated up to 4 credits.

**Prerequisite(s):** CHEM 112G.

**CHEM 217. General Chemistry III****3 Credits (2+3P)**

Quantitative aspects of general chemistry: solid state structure, equilibrium, thermodynamics, and kinetics. Required of chemical science majors who have taken CHEM 111G/112.

**Prerequisite:** CHEM 112G.

**CHEM 241. Introduction to Research****1-3 Credits (3+9P)**

Techniques and procedures of chemical research. May be repeated for a maximum of 3 credits.

**Prerequisites:** 8 credits of chemistry and a 3.0 GPA in chemistry.

**CHEM 242. Explorations in Chemistry****1 Credit**

Historical and current developments, careers in chemistry, computer applications and use of the library by chemists. To be completed before the end of the sophomore year. Graded S/U.

**CHEM 251. Special Topics in Chemistry****1-6 Credits (1-6)**

Specific subjects in Chemistry. These subjects will be announced in the 'Schedule of Classes'. It may be repeated under different topics for a maximum of 12 credits.

**CHEM 303. Organic Supplemental Instruction I****1 Credit**

Collaborative workshop for students in Organic Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 313.

**CHEM 304. Organic Supplemental Instruction II****1 Credit**

Collaborative workshop for students in Organic Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 314.

**CHEM 313. Organic Chemistry I****3 Credits**

Nomenclature, uses, basic reactions, and preparation methods of the most important classes of aliphatic and aromatic compounds.

**Prerequisite:** CHEM 112G or CHEM 116.

**CHEM 314. Organic Chemistry II****3 Credits**

Nomenclature, uses, basic reactions, and preparation methods of the most important classes of aliphatic and aromatic compounds.

**Prerequisite:** C or better in CHEM 313.

**CHEM 315. Organic Chemistry Laboratory****2 Credits**

Techniques, preparative and analytical methods in organic chemistry.

**Prerequisite:** C or better in CHEM 313 or consent of instructor.

**Corequisite:** CHEM 314.

**CHEM 351. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**CHEM 356. Descriptive Inorganic Chemistry****3 Credits**

Occurrence and properties of the elements and the chemistry of their compounds. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 112G or CHEM 116 and CHEM 211 or CHEM 313.

**CHEM 357. Synthetic Inorganic Laboratory****2 Credits**

Explores synthesis and analysis of main group and transition metal inorganic compounds. Inorganic laboratory and spectroscopic techniques will be used.

**Prerequisites:** CHEM 356.

**CHEM 360. General Geochemistry****3 Credits**

Same as GEOL 360.

**CHEM 371. Analytical Chemistry****4 Credits (2+6P)**

The fundamentals of quantitative chemical analysis. May be repeated up to 4 credits.

**Prerequisite(s):** CHEM 112G or CHEM 116.

**CHEM 422. Environmental Chemistry****3 Credits**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: E S 422

**Prerequisite(s):** CHEM 112G and either CHEM 211 or CHEM 313.

**CHEM 424. Soil Chemistry****3 Credits**

Same as SOIL/GEOL 424.

**CHEM 431. Physical Chemistry****3 Credits**

Principles that govern the physical and chemical behavior of matter. May not be counted toward Bachelor of Science degree in Chemistry.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 212 or PHYS 222G or PHYS 214 or PHYS 216G.

**CHEM 431 H. Physical Chemistry Honors****3 Credits**

Same as CHEM 431. Additional work to be arranged.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 212G or PHYS 222G or PHYS 214 or PHYS 216G.

**CHEM 433. Physical Chemistry I****3 Credits**

Laws and theories underlying chemical phenomena.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 214 or PHYS 216G, or consent of instructor.

**CHEM 433 H. Physical Chemistry I Honors****3 Credits**

Same as CHEM 433. Additional work to be arranged.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 214 or PHYS 216G, or consent of instructor.

**CHEM 434. Physical Chemistry II****3 Credits**

Laws and theories underlying chemical phenomena.

**Prerequisite:** CHEM 302 or CHEM 433.

**CHEM 435. Physical Chemistry Laboratory****2 Credits**

**Prerequisite:** concurrent registration in CHEM 434.

**CHEM 441. Advanced Research****1-3 Credits (3+9P)**

Investigation of chemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

**Prerequisites:** consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

**CHEM 443. Senior Seminar****1 Credit**

Discussions of current chemical research, impact of chemistry on society and/or ethics as applied to chemists. Each student will present a written and an oral report on an approved topic.

**Prerequisite:** CHEM 431 or CHEM 433.

**CHEM 451. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**CHEM 455. Independent Studies****1-3 Credits**

Independent studies directed by consulting faculty.

**Prerequisite:** consent of instructor.

**CHEM 456. Inorganic Structure and Bonding****3 Credits**

Theoretical principles and a systematic study of the periodic table.

**Prerequisite:** CHEM 356 or CHEM 431 or CHEM 433.

**CHEM 466. Advanced Organic Chemistry****3 Credits**

Recent developments in synthesis and theoretical principles of organic chemistry.

**Prerequisite:** CHEM 314.

**CHEM 466 H. Advanced Organic Chemistry Honors****3 Credits**

Same as CHEM 466. Additional work to be arranged.

**CHEM 471. Instrumental Methods of Analysis****4 Credits (3+3P)**

Analytical techniques, including optical and procedures.

**Prerequisites:** CHEM 371 and either PHYS 212G or PHYS 216G.

**CHEM 500. Seminar in Inorganic Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 507. Chemistry of the Elements****3 Credits**

Discussion of the reactions and structures of inorganic compounds.

**CHEM 510. Seminar in Organic Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 514. Organic Structure Determination****3 Credits**

Modern spectroscopic techniques for characterization of organic compounds.

**CHEM 515. Modern Organic Chemistry****3 Credits**

Recent developments in synthesis and theoretical principles of organic chemistry.

**CHEM 516. Physical Organic Chemistry****3 Credits**

Physical organic chemistry.

**CHEM 517. Synthetic Organic Chemistry****3 Credits**

Synthetic methods in organic chemistry.

**CHEM 520. Seminar in Analytical Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 521. Chemical Instrumentation****3 Credits (2+3P)**

Theory and application of electronic devices to chemical analysis.

**CHEM 526. Advanced Analytical Chemistry****3 Credits**

Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.

**CHEM 527. Separations****3 Credits**

Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.

**CHEM 528. Electroanalytical Techniques****3 Credits**

Theory and application of modern electrochemical methods of analysis including voltammetry, amperometry, modern cyclic and pulse methods, and stripping analysis.

**CHEM 529. Spectrochemical Analysis****3 Credits**

Fundamentals, instrumentation, and applications of spectrochemical analysis.

**CHEM 530. Seminar in Physical Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 536. Chemical Thermodynamics****3 Credits**

First, second, and third laws of thermodynamics, and the concepts, interrelations, and applications of thermodynamic state functions.

**CHEM 537. Quantum Chemistry****3 Credits**

Fundamentals of quantum mechanics.

**Prerequisite:** consent of instructor.

**CHEM 538. Chemical Kinetics****3 Credits**

Empirical analysis of rate measurements, collision theory, transition state theory, and chain reactions.

**CHEM 539. Spectroscopy****3 Credits**

Molecular spectroscopy for physical chemistry. Quantum mechanics applied to spectroscopy of polyatomic molecules: UV-VIs, IR, magnetic resonance. CHEM 537 desired but not required. Prerequisite: consent of instructor.

**Prerequisite:** consent of instructor.

**CHEM 560. Discussions in Organic Chemistry****1 Credit**

Current research problems in organic chemistry. May be repeated. Graded S/U.

**CHEM 570. Discussions in Analytical Chemistry****1 Credit**

Current research problems in analytical chemistry. May be repeated. Graded S/U.

**CHEM 580. Discussions in Physical Chemistry****1 Credit**

Current research problems in physical chemistry. May be repeated. Graded S/U.

**CHEM 598. Special Research Programs****1-3 Credits**

Individual investigations, either analytical or experimental. Graded S/U.

**CHEM 599. Master's Thesis****15 Credits**

Thesis preparation.

**CHEM 600. Research****1-15 Credits**

Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

**CHEM 609. Topics in Inorganic Chemistry****1-3 Credits**

Selected topics of current interest designated by subtitle.

**CHEM 619. Topics in Organic Chemistry****1-3 Credits**

Selected topics of current interest designated by subtitle.

**CHEM 629. Advanced Topics in Analytical Chemistry****3 Credits**

Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.

**CHEM 639. Topics in Physical Chemistry****1-3 Credits**

Selected topics of current interest designated by subtitle.

**CHEM 650. Advanced Seminar****1 Credit**

Intended for students who have earned a master's degree or the equivalent. A discussion of current topics of interest in chemistry. May be repeated.

**CHEM 700. Doctoral Dissertation****17 Credits**

Dissertation preparation.

**Phone:** (575) 646-2505

**Website:** <http://www.chemistry.nmsu.edu/>

## Biochemistry - Bachelor of Science

**Nondepartmental Requirements**

A ST 311	Statistical Applications	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
BIOL 377	Cell Biology	3
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
Select one from the following:		6
PHYS 213 & PHYS 214	Mechanics and Electricity and Magnetism	
PHYS 211G & PHYS 212G	General Physics I and General Physics II	
PHYS 215G & PHYS 216G	Engineering Physics I and Engineering Physics II	
PHYS 221G & PHYS 222G	General Physics for Life Sciences I and General Physics for Life Sciences II	
Select one from the following:		2
PHYS 213 L & PHYS 214 L	Experimental Mechanics and Electricity and Magnetism Laboratory	
PHYS 211GL & PHYS 212GL	General Physics I Laboratory and General Physics II Laboratory	

**Departmental Requirements**

Select one from the following:		8-11
CHEM 115 & CHEM 116	Principles of Chemistry I and Principles of Chemistry II	
CHEM 111G & CHEM 112G & CHEM 217	General Chemistry I and General Chemistry II and General Chemistry III	

CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
BCHE 140	Introduction to Biochemistry	1
BCHE 395	Biochemistry I	3
BCHE 396	Biochemistry II	3
BCHE 397	Experimental Biochemistry Laboratory	3
BCHE 440	Biochemistry Seminar	1
BCHE 494	Biochemical Genetics Laboratory	3
Select one from the following:		6
CHEM 433 & CHEM 434	Physical Chemistry I and Physical Chemistry II	
CHEM 431 & CHEM 456	Physical Chemistry and Inorganic Structure and Bonding	
CHEM 431 & CHEM 356	Physical Chemistry and Descriptive Inorganic Chemistry	
CHEM 431 & BCHE 432	Physical Chemistry and Physical Biochemistry	
Select one from the following additional classes not used to fulfill another departmental requirement:		1-3
BCHE 432	Physical Biochemistry	
BCHE 446	Biochemistry III	
BCHE 451	Special Topics (by petition only)	

**Electives**

Select sufficient electives to bring total credits to 120, including 48 upper division. 40

**Second Language Requirement: (not required)**

Total Credits 115-120

**Second Language Requirement**

For the Bachelor of Science with a major in Biochemistry there is no second language requirement for the degree.

**Chemistry - Bachelor of Arts**

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The program may be used by students planning extensive study in other areas and requires emphasis in a second field of study. Emphasis area credits cannot be used for Bachelor of Arts degree.

**Requirements****Nondepartmental Requirements**

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
Select one from the following:		6
PHYS 211G & PHYS 212G	General Physics I and General Physics II	
PHYS 221G & PHYS 222G	General Physics for Life Sciences I and General Physics for Life Sciences II	
PHYS 211GL	General Physics I Laboratory	1
PHYS 212GL	General Physics II Laboratory	1
Select 18 credits from an Emphasis area <sup>1</sup>		18

**Departmental Requirements**

Select one from the following: 8-11

CHEM 115 & CHEM 116	Principles of Chemistry I and Principles of Chemistry II	
CHEM 111G & CHEM 112G & CHEM 217	General Chemistry I and General Chemistry II and General Chemistry III	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 356	Descriptive Inorganic Chemistry	3
CHEM 357	Synthetic Inorganic Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 431	Physical Chemistry	3
CHEM 443	Senior Seminar	1
Additional Chemistry credits		3

**Electives**

Select sufficient electives to bring total credits to 120, including 48 upper-division. <sup>2</sup> 51

**Second Language Requirement: (not required)**

Total Credits 117-120

<sup>1</sup> Nine credits must be upper-division. See advisor for approval.

<sup>2</sup> BCHE 341 Survey of Biochemistry or BCHE 395 Biochemistry I can be used for electives.

**Second Language Requirement**

For the Bachelor of Arts with a major in Chemistry there is no second language requirement for the degree.

**Chemistry - Bachelor of Science****Nondepartmental Requirements**

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
PHYS 213	Mechanics	3
PHYS 213 L	Experimental Mechanics	1
PHYS 214	Electricity and Magnetism	3
PHYS 214 L	Electricity and Magnetism Laboratory	1
PHYS 315	Modern Physics	3
Select 3-4 credits from the following:		3-4
MATH 391	Vector Analysis	
MATH 392	Introduction to Ordinary Differential Equations	
C S 172	Computer Science I	
STAT 371	Statistics for Engineers and Scientists I	

**Departmental Requirements**

BCHE 395 or BCHE 341	Biochemistry I Survey of Biochemistry	3-4
Select one from the following:		8-11
CHEM 115 & CHEM 116	Principles of Chemistry I and Principles of Chemistry II	
CHEM 111G & CHEM 112G & CHEM 217	General Chemistry I and General Chemistry II and General Chemistry III	

CHEM 242	Explorations in Chemistry	1
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 356	Descriptive Inorganic Chemistry	3
CHEM 357	Synthetic Inorganic Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 433	Physical Chemistry I	3
CHEM 434	Physical Chemistry II	3
CHEM 435	Physical Chemistry Laboratory	2
CHEM 443	Senior Seminar	1
CHEM 456	Inorganic Structure and Bonding	3
CHEM 471	Instrumental Methods of Analysis	4

**Electives**

Select sufficient electives to bring total credits to 120, including 48 upper-division. 45

**Second Language Requirement: (not required)**

Total Credits 115-120

*Note: Students should work closely with their advisors and review carefully the prerequisites for and the sequential nature of courses required for the Bachelor of Science.*

**Second Language Requirement**

For the Bachelor of Science with a major in Chemistry there is no second language requirement for the degree.

**Biochemistry - Undergraduate Minor****Required Courses**

BCHE 395	Biochemistry I	3
CHEM 111G	General Chemistry I	4
or CHEM 115	Principles of Chemistry I	
CHEM 112G	General Chemistry II	4
or CHEM 116	Principles of Chemistry II	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
One additional Biochemistry (BCHE) course		1-3
Total Credits		18-20

**The following (BCHE) courses do not count towards minor:**

BCHE 341	Survey of Biochemistry	4
BCHE 440	Biochemistry Seminar	1

Toxicology and Supplemental Instruction (SI) courses are not accepted.

**Courses provisionally allowed:**

BCHE 441	Advanced Research in Biochemistry (3 credits maximum)	1-3
BCHE 451	Special Topics (by petition only)	1-3

**Chemistry - Undergraduate Minor****Required Courses**

CHEM 111G	General Chemistry I	4
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or CHEM 115	Principles of Chemistry I	
CHEM 112G	General Chemistry II	4
or CHEM 116	Principles of Chemistry II	
CHEM 211	Organic Chemistry	3-4
or CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	3

**Additional Courses**

Select sufficient additional upper division CHEM/BCHE credits to bring total upper division CHEM/BCHE credits to at least 9 from the following:

**Physical/Analytical Chemistry Emphases**

CHEM 356	Descriptive Inorganic Chemistry	
CHEM 371	Analytical Chemistry	
CHEM 431	Physical Chemistry	

**Biochemical Emphasis**

CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	
BCHE 341	Survey of Biochemistry	

Total Credits 17-18

**The following courses do not count towards a minor in Chemistry:**

CHEM 100	Basic Chemistry	3
CHEM 110G	Principles and Applications of Chemistry	4
CHEM 217	General Chemistry III	3
CHEM 241	Introduction to Research	1-3
CHEM 351	Special Topics	1-3
CHEM 443	Senior Seminar	1

No BCHE courses except BCHE 341

Supplemental instruction (SI) courses are not accepted.

**Courses provisionally allowed:**

CHEM 441	Advanced Research (3 credits maximum)	1-3
CHEM 451	Special Topics (by petition only)	1-3

**Environmental Chemistry - Undergraduate Minor**

Students must pass the courses listed below. Check the undergraduate catalog for prerequisites.

**Required Courses**<sup>1</sup>

BIOL 477	Applied and Environmental Microbiology	4
C E 256	Environmental Engineering and Science	3
C E 355V	Technology and the Global Environment	3
C E 356	Fundamentals of Environmental Engineering	3
CHEM 111G	General Chemistry I	4
or CHEM 115	Principles of Chemistry I	
CHEM 112G	General Chemistry II	4
or CHEM 116	Principles of Chemistry II	
CHEM 211	Organic Chemistry	3-4
or CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	3

CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
or CHEM 471	Instrumental Methods of Analysis	
CHEM 422	Environmental Chemistry	3
CHEM 424	Soil Chemistry	3
CHEM 451	Special Topics	1-3
I E 411	Occupational Safety	3
TOX 361	Basic Toxicology	3
Total Credits		46-49

<sup>1</sup> B.A. or B.S. majors in Chemistry or Biochemistry must pass an additional 9 credits from these courses; CHEM 451 Special Topics: as appropriate.

The following courses do not count toward a minor in Environmental Chemistry:

CHEM 100	Basic Chemistry	3
CHEM 110G	Principles and Applications of Chemistry	4

Supplemental instruction (SI) courses are not accepted.

## Chemistry - Master of Science

The core course work required of students entering with no previous graduate study in chemistry or biochemistry consists of basic core courses completed in one of the following options:

- two courses chosen respectively from two of the five major areas represented in the department apart from a student's elected field of thesis research; or
- one course chosen from the five major areas apart from the student's elected field of thesis research plus one graduate-level course in a discipline outside the Department of Chemistry and Biochemistry.

A master's candidate will plan an appropriate program of further study with his or her advisor and is also required to prepare a thesis. The thesis requirement may be waived upon application to the department head, after completion of the doctoral comprehensive examination requirements.

## Chemistry - Doctor of Philosophy

A chemistry student who successfully completes the Ph.D. qualifying examination will begin writing the cumulative examinations, which constitute the written portion of the comprehensive examination. After completion of the qualifying exam, a doctoral committee is formed to assist the student in planning a program appropriate to his or her background and goals.

## Communication Studies

### Undergraduate Program Information

The communication studies program is designed to enhance students' interpersonal skills, presentation skills and critical thinking skills. Thus the successful graduate should be able to work effectively with people, assimilate, organize and analyze information, solve problems, make effective presentations and show potential for leadership. The program prepares students for careers in several professions, such as training and development, public relations, law, advertising and sales, government

service, mediation, customer relations, human resources, international service, fundraising and the ministry.

### Graduate Program Information

The Master of Arts in Communication Studies provides students with a social scientific approach to the study of human interaction, using quantitative and qualitative methods. Our curriculum is designed to explore how oral communication takes place interpersonally, within organizations, within our political system, and between and within cultures. Students take courses in interpersonal communication, organizational communication, political communication and/or cultural communication. All graduate students take courses in communication theory and research methods. In addition, students can take courses in topic areas such as conflict management, small group communication, persuasion and nonverbal communication.

The program offers a wide variety of courses allowing students an opportunity to select topics pursuant to their special interests. In addition to courses, students have the opportunity to obtain practical experience by participating in professional activities offered by the department; for example, graduate teaching assistantships, research and colloquia.

### Degrees for the Department

Communication Studies - Bachelor of Arts (p. 244)

Communication Studies - Master of Arts (p. 245)

### Minors for the Department

Communication and National Security - Undergraduate Minor (p. 245)

Communication Studies - Undergraduate Minor (p. 245)

Communication and National Security - Graduate Minor (p. 246)

Communication Studies - Graduate Minor (p. 246)

### Professor Kenneth L. Hacker, Department Head

**Professors** Hacker, Hubbell, Flora, **Associate Professors** Morgan, Armfield; **Assistant Professors** Halliwell

*K. Hacker, Department Head, Ph.D. (Oregon)– new media networking, political communication, national security communication; G. Armfield, Ph.D. (University of Missouri-Columbia)– organizational communication, communication and sports; J. Flora, Ph.D. (Kansas)– communication; A. Hubbell, Ph.D. (Michigan State) – organizational communication, health communication; E. Morgan, Ph.D. (University of Massachusetts-Amherst)– communication and culture, environmental communication; D. Halliwell, Ph.D. (University of Missouri)- interpersonal communication, communication and technology.*

## Communication Studies Courses

### **COMM 250. Introduction to the Communication Major** **1 Credit**

This is a one-credit course for new Communication Studies majors. It helps them get acquainted with the department, the department head (professor for this course, the professors, other students, and the department student organizations). It also deals with degree mapping and career mapping and any problems the students are having in their first year. Finally, the students learn about the the Communication Studies discipline and various communication careers they can pursue with their degree. The class meets one day each week for one hour. Restricted to: Communication Studies majors. Restricted to Las Cruces campus only.

### **COMM 253G. Public Speaking** **3 Credits**

Principles of effective public speaking, with emphasis on preparing and delivering well-organized, logical, and persuasive arguments adapted to different audiences.

### **COMM 265G. Principles of Human Communication** **3 Credits**

Study and practice of interpersonal, small group, and presentational skills essential to effective social, business, and professional interaction.

### **COMM 285. Survey of Communication Theory** **3 Credits**

Exploration of major theories, concepts and methods of research in the study of human communication. Primarily for majors.

### **COMM 290. Independent Study** **1-3 Credits**

Individualized, self-paced projects for students with a special interest in communication topics. May be repeated for a maximum of 6 credits.

**Prerequisites:** COMM 265G and sophomore standing.

### **COMM 291. Special Topics** **1-3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

### **COMM 305. Communication Research Methods** **3 Credits**

Introductory course in communication research. Emphasis on how to be an effective consumer of research.

### **COMM 351. Persuasion Theory and Practice** **3 Credits**

Training in understanding and applying the principles and techniques of argumentation and persuasion.

### **COMM 370. Organizational Communication** **3 Credits**

Communication strategies and patterns of private and governmental organizations, including research on the communication process.

### **COMM 376. Communication and Culture** **3 Credits**

Cultural and intercultural communication theory and behavior, with a concentration on the development of specific communication skills which should facilitate effective intercultural communication.

### **COMM 377. Conflict Management** **3 Credits**

Communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings.

### **COMM 384. Interpersonal Communication** **3 Credits**

Theories of interpersonal communication and relational communication including study of relevant models, contexts and constructs.

### **COMM 425. Small Group Communication** **3 Credits**

Principles and methods of modern group discussion with emphasis on the role of the group in problem solving.

### **COMM 440. Political Communication** **3 Credits**

Presidential and congressional campaigns, political persuasion techniques, political advertising, power in language, and media aspects of political information. Ideology, resistance to political manipulation, and dependence of democracies on communication.

### **COMM 450. Technologies of Human Communication** **3 Credits**

Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management.

**Prerequisite:** junior or senior standing.

### **COMM 455. Fundamentals of Communication and National Security** **3 Credits**

This course addresses communication perspectives informing national security, strategic intelligence, and the intelligence process. Students will examine U.S. national security history, policy, the development of the Intelligence Community, and intelligence as processes of communication. This course serves as an introduction to national security studies.

### **COMM 456. Communication and the Intelligence Cycle** **3 Credits**

The course addresses communication requirements and the technical, cognitive, and cultural complexity of the collaborative research environment. Students participate in novel, team-based problem scenarios that provide the foundation for acquiring advanced cognitive analytic methods and strategies. Students will engage in interdisciplinary information science processes and will develop and present analytic products responding to national security requirements.

### **COMM 457. Strategic Communication and Public Diplomacy** **3 Credits**

This course covers history, theory, and research related to the use of communication to change attitudes in favor of U.S. national security interests. Students will examine the use of strategic communication and influence in diplomacy, intelligence, and military communities in terms of specific strategies, effects, and issues. Students will learn to distinguish public diplomacy, information operations, public affairs, and other forms of political communication that are used by the U.S. government to persuade target populations about American interests and goals. Topics include soft power, intelligence-based negotiation processes, and research methods used to identify influence techniques or groups that threaten U.S. national security.

**COMM 458. Intercultural Communication and National Security****3 Credits**

This course provides a concentration on cultural factors in international affairs and conflicts, how culture affects perceptions of national interests, and the relationship of U.S. national security to understand the general and political cultures of other nations. Students will integrate cultural and intercultural communication theory and behavior, with an emphasis on the development of specific communication skills to facilitate developing cultural knowledge in government and political contexts. Students will learn how to study the cultural factors that affect international conflicts and how strategic communication should address such cultural factors.

**COMM 460. Deception and Communication****3 Credits**

Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation.

**COMM 462. Family Communication****3 Credits**

A communication perspective on traditional and nontraditional family configurations, roles, interaction patterns, and conflict. Includes an examination of media depictions of families and family interaction, as well as current social and political issues related to the family.

**COMM 465. Nonverbal Communication****3 Credits**

Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process.

**COMM 470. Leadership Communication****3 Credits**

Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions.

**COMM 471. Sports Communication****3 Credits**

This course provides a senior-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fandom and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 571.

**COMM 475. International Communication****3 Credits**

Exploration of the forms and channels of communication substantially influenced by international cultural and political factors. Covers: global communication technology; news, information and entertainment flows; international diplomacy and negotiation, communication in war and peace.

**COMM 477. Environmental Communication****3 Credits**

Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment.

**COMM 480. Health Communication****3 Credits**

Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures.

**COMM 484. Verbal Communication****3 Credits**

Examination of rules governing conversational structures such as speech acts, action sequences, topics and topic shifts. Also covers humor in conversation and conversational control.

**COMM 485. International Teaching Assistant Development****3 Credits**

International teaching assistants will receive instruction in communicative skills to enable them to meet their responsibilities at NMSU. Course includes lectures, seminars, video-taped presentations, and tutorial sessions emphasizing pedagogic and presentation skills and styles.

**Prerequisite:** consent of instructor.

**COMM 490. Independent Study****1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.

**Prerequisites:** COMM 265G and junior standing with consent of participating instructor.

**COMM 491. Selected Topics****1-6 Credits**

Individual and/or group study of selected topics. To be identified by subtitle. May be repeated for a maximum of 12 credits.

**Prerequisite:** prior arrangement with faculty supervisor(s).

**COMM 495. Communication Internship****3 Credits**

Internship opportunity to apply what has been learned to a real-world situation. May be repeated for a maximum of 6 credits. Restricted to majors.

**Prerequisite:** junior standing and 3.0 GPA in major.

**COMM 505. Research Methods****3 Credits**

Seminar in the quantitative study of human communication phenomena, research design, and statistical analysis.

**COMM 506. Qualitative Research Methods in Communication****3 Credits**

Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research.

**COMM 540. Seminar in Political communication****3 Credits**

Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods.

**COMM 545. Seminar in Ethicism, Racism, and Communication****3 Credits**

Course focuses on theories and research concerning the social, cognitive, and communication aspects of ethnic and racial prejudice. Specific psychological and communication processes of person and group categorization are explored along with findings about the effects of ethnic prejudice on everyday communication (and vice versa).

**COMM 550. Seminar in Communication Technologies****3 Credits**

Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization.

**COMM 551. Seminar in Persuasion****3 Credits**

Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects.

**Prerequisite:** COMM 351 or consent of instructor.

**COMM 555. Seminar Fundamentals of Communication and National Security****3 Credits**

This seminar course addresses communication perspectives informing national security, strategic intelligence, and the intelligence process. Students will examine U.S. national security history, policy, the development of the Intelligence Community, and intelligence as processes of communication. This course serves as an introduction to national security studies. Graduate students are required to fulfill advanced research and presentation requirements.

**COMM 556. Seminar Communication and the Intelligence Cycle****3 Credits**

This seminar course addresses communication requirements and the technical, cognitive, and cultural complexity of the collaborative research environment. Students participate in novel, team-based problem scenarios that provide the foundation for acquiring advanced cognitive analytic methods and strategies. Students will engage in interdisciplinary information science processes and will develop and present analytic products responding to national security requirements. Graduate students will be required to fulfill advanced research and presentation requirements.

**COMM 557. Seminar Strategic Communication and Public Diplomacy****3 Credits**

The seminar course covers history, theory, and research related to the use of communication to change attitudes in favor of U.S. security interests. Students will examine the use of strategic communication and influence in diplomacy, intelligence, and military communities in terms of specific strategies, effects, and issues. Students will learn to distinguish public diplomacy, information operations, public affairs, and other forms of political communication that are by the U.S. government to persuade target populations about American interests and goals. Topics include soft power, intelligence-based negotiation processes, and research methods used to identify influence techniques of groups that threaten U.S. national security. Graduate students will be required to fulfill advanced research and presentation requirements.

**COMM 558. Seminar Intercultural Communication and National Security****3 Credits**

The seminar course provides a concentration on cultural factors in international affairs and conflicts, how culture affects perceptions of national interests, and the relationship of U.S. national security to understand the general and political cultures of other nations. Students will integrate cultural and intercultural communication theory and behavior, with an emphasis on the development of specific communication skills to facilitate developing cultural knowledge in government and political contexts. Students will learn how to study the cultural factors that affect international conflicts and how strategic communication should address such cultural factors. Graduate students will be required to fulfill advanced research and presentation requirements.

**COMM 562. Seminar in Family Communication****3 Credits**

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. Topics include basic family communication processes, communication in family subsystems, communication during family stress, and the role of family interaction in health and well-being. Students will explore how family relationships are built, maintained, and destroyed by communication as well as the potentially important and long lasting effects of family relationships on individuals.

**COMM 565. Seminar in Nonverbal Communication****3 Credits**

This course focuses on human physical behaviors as the basis of communication between persons. This physical behavior includes such variables as the voice, face, eyes, posture, gesture, space, territory, clothing, and touch. The content of the course considers the individual and social factors affecting the production of such behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships. Applications of research and theory in nonverbal communication to infant development, personality, sex differences, marital satisfaction, relationship development, culture, aging, and brain functioning are also studied throughout the course.

**COMM 570. Seminar in Organizational Communication****3 Credits**

Communication strategies and patterns of private and governmental organizations, including research on communication systems.

**COMM 571. Seminar in Sports Communication****3 Credits**

This seminar provides a graduate-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fandom and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 471.

**COMM 576. Seminar on Communication and Culture****3 Credits**

Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures.

**COMM 583. Seminar in Theories of Communication****3 Credits**

Communication systems, symbolic processes, analysis of messages.

**COMM 584. Seminar in Interpersonal Communication****3 Credits**

Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs.

**COMM 590. Independent Study****1-6 Credits**

Individualized, self-paced projects.

**Prerequisite:** consent of instructor.

**COMM 591. Special Topics****1-9 Credits**

Individual and/or group study of special topics. To be identified by subtitle.

**Prerequisite:** prior arrangement with faculty supervisor(s).

**COMM 595. Communication Internship for Graduate Students****3 Credits**

Internship opportunity to apply what students have learned to the real world. Restricted to majors.

**Prerequisite:** 9 credits of M.A. degree.

**COMM 599. Master's Thesis****15 Credits**

Thesis.

**Phone:** (575) 646-2801

**Website:** <https://commstudies.nmsu.edu/>

## Communication Studies - Bachelor of Arts

In addition to completing the general education requirements of the university and the college, students majoring in communication studies are required to complete 24 credits of core COMM courses and 12 credits of COMM electives for a total of 36 credits. Any exception to these policies requires department head approval.

All COMM courses must be completed with a grade of C- or better.

### Requirements

<b>General Education Requirements</b> <sup>1</sup>	36
<b>Viewing a Wider World Requirements</b> <sup>2</sup>	6
<b>Core Courses</b>	21
COMM 265G Principles of Human Communication	
COMM 285 Survey of Communication Theory	
COMM 305 Communication Research Methods	
COMM 351 Persuasion Theory and Practice	
COMM 370 Organizational Communication	
COMM 376 Communication and Culture	
COMM 384 Interpersonal Communication	
COMM 495 Communication Internship	
<b>Departmental Elective Courses</b>	
Select an additional 12 credits from COMM to reach a total of 36 credits.	12
<b>General Electives to bring total to 120</b>	42
<b>Second Language Requirement: (required- see below)</b>	
<b>Total Credits</b>	117

<sup>1</sup> For Information regarding the General Education Course Requirements see the General Education Courses (p. 46) section of the catalog.

<sup>2</sup> For information on the Viewing a Wider World Requirements, see the General Education Courses (p. 46) section of the catalog

### Second Language Requirement

For the Bachelor of Arts in Communication Studies there is a two year second language requirement, the student must do one of the following:

**Option 1:**

**Complete one of the following sequences:**

CHIN 111 & CHIN 112 & CHIN 211 & CHIN 212	Elementary Chinese I and Elementary Chinese II and Intermediate Chinese I and Intermediate Chinese II	14
FREN 111 & FREN 112 & FREN 211 & FREN 212	Elementary French I and Elementary French II and Intermediate French I and Intermediate French II	14
GER 111 & GER 112 & GER 211 & GER 212	Elementary German I and Elementary German II and Intermediate German I and Intermediate German II	14
JPNS 111 & JPNS 112 & JPNS 211 & JPNS 212	Elementary Japanese I and Elementary Japanese II and Intermediate Japanese I and Intermediate Japanese II	14
SPAN 111 & SPAN 112 & SPAN 211 & SPAN 212	Elementary Spanish I and Elementary Spanish II and Intermediate Spanish I and Intermediate Spanish II	14
PORT 213 & PORT 214	Portuguese for Romance Language Students I and Portuguese for Romance Language Students II	6

*For Heritage Speakers:*

SPAN 113 & SPAN 213 & SPAN 214	Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	9
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**Option 2:**

**Complete two semesters of American Sign Language (with a C- or better):**

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3
C D 476	American Sign Language III	3

**Option 3:**

**Challenge the 212 level for the following courses:**

CHIN 212	Intermediate Chinese II	3
or FREN 212	Intermediate French II	
or GER 212	Intermediate German II	
or JPNS 212	Intermediate Japanese II	
or SPAN 212	Intermediate Spanish II	

OR

**Challenge the 214 level for the following courses:**

PORT 214 Portuguese for Romance Language Students II  
 or SPAN 214 Spanish for Heritage Learners III

3 A minor in Communication Studies consists of 18 credits; at least 9 of those credits must be in courses numbered 300 or above. All courses must be completed with grades of C- or better.

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Communication and National Security - Undergraduate Minor

A minor in Communication and National Security consists of 18 credits, 12 credits of required courses and 6 credits of electives. All courses must be completed with grades of "C-" or better.

**Required Courses**

COMM 455	Fundamentals of Communication and National Security	3
COMM 456	Communication and the Intelligence Cycle	3
COMM 457	Strategic Communication and Public Diplomacy	3
COMM 458	Intercultural Communication and National Security	3

**Additional Courses**

Select two from the following:		6
GEOG 281	Map Use: Reading, Analysis and Interpretation	
GEOG 363V	Cultural Geography	
SOC 362	Urban Society in a Global World: Problems, Prospects, and Promises	
SOC 489	Globalization	
Total Credits		18

Note: If any of the above courses are not available the department will consider course substitutions.

## Communication Studies - Undergraduate Minor

**Required Course**

COMM 265G	Principles of Human Communication	3
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**Additional Courses**

Select two from the following:		6
COMM 370	Organizational Communication	
COMM 376	Communication and Culture	
COMM 384	Interpersonal Communication	
Select 9 credits from the following:		9
COMM 253G	Public Speaking	
COMM 285	Survey of Communication Theory	
COMM 305	Communication Research Methods	
COMM 351	Persuasion Theory and Practice	
COMM 425	Small Group Communication	
COMM 440	Political Communication	
COMM 450	Technologies of Human Communication	
COMM 465	Nonverbal Communication	
COMM 470	Leadership Communication	
COMM 475	International Communication	
COMM 480	Health Communication	
COMM 490	Independent Study	
COMM 491	Selected Topics	

Total Credits 18

## Communication Studies - Master of Arts

The department offers both thesis and non-thesis options in its Masters of Arts program. Both options require a minimum of 36 credits, which includes not only Communication courses but courses from outside the department. The thesis option requires at least 30 credits of coursework, 6 credits of thesis (COMM 599 Master's Thesis), and an oral defense of the thesis and coursework. The non-thesis option requires 36 credits of coursework, plus a comprehensive written examination, followed by an oral defense. The project option requires 6 credits of a project. All options require a minimum of 30 credit hours of Communication courses.

Select 15 credits from Communication Studies Electives for the Thesis Option. Take 15 credits plus 6 credits from related disciplines for the Non-Thesis Option. Two courses (6 credits) for courses that have numbers 450+ can be counted. For either the Thesis or the Non-Thesis option, a total of 36 credits is required.

**Degree Requirements**

COMM 505	Research Methods	3
or COMM 506	Qualitative Research Methods in Communication	
COMM 583	Seminar in Theories of Communication	3
Select three from the following:		9
COMM 540	Seminar in Political communication	
COMM 570	Seminar in Organizational Communication	
COMM 576	Seminar on Communication and Culture	
COMM 584	Seminar in Interpersonal Communication	

**COMM Electives**

Select 15 credits from Electives in Related Fields, 3-6 credits from (graduate levels; numbered 450+). 15

**Thesis, Non-Thesis or Project Options**

Select one from the following: 3-6

Thesis Option: Select 6 credits from COMM 599.

Non-thesis Option: Select 3-6 credits from Additional Graduate COMM Electives.

Project Option: Select 6 credits from COMM 590

Total Credits 33-36

A GPA of 3.0 or better must be maintained overall and grades in each course must be a B- or better.

## Entrance Requirements for Graduate Study in Communication Studies

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. Students wishing to enroll in the Master program in Communication Studies must meet the following criteria:

1. Hold a BA or BS degree, from an accredited institution of higher learning; Social Science disciplines are preferred
2. Hold a minimum grade point average of 3.00

To apply for an graduate study in our department, please submit the following application materials:

- Three very positive letters of recommendation
- Current Vitae/Resume
- 750 word statement of intent
- A sample of scholarly writing

If you seek to have a graduate teaching assistantship, please indicate so with your application letter. Such positions are competitive.

## Communication and National Security - Graduate Minor

This minor is aimed at graduate students who seek employment in national security, intelligence, international business, military affairs in other nations, and other positions which require knowledge of how communication affects the national image of the United States and how Americans communicate with members of other cultures about political matters. Graduate students will be required to write a special analysis for each course that is not required of the undergraduate students. Each graduate student will also be required to present a one-hour lecture on an area of research specialization.

### Requirements

Students will take three of four courses below plus one outside course approved by the department. The list below is our expected course rotation.

**Requirements**

Select three from the following: 9

COMM 555 Seminar Fundamentals of Communication and National Security

COMM 556 Seminar Communication and the Intelligence Cycle

COMM 557 Seminar Strategic Communication and Public Diplomacy

COMM 558 Seminar Intercultural Communication and National Security

**Other Departments**

Select one from the following: <sup>1</sup> 3

GEOG 501 Research Design and History of Geographic Thought <sup>2</sup>

HIST 561 Islam and the West: Cultural Contacts, Conflicts and Exchanges <sup>3</sup>

SOC 489 Globalization

Total Credits 12

<sup>1</sup> The courses from other departments can include special topics courses or related courses relevant to this minor, as well as regular courses such as the ones listed.

<sup>2</sup> Should focus research project on national security.

<sup>3</sup> Pre-requisites or co-requisites include HIST 221G Islamic Civilizations to 1800 or HIST 222G Islamic Civilizations since 1800.

## Communication Studies - Graduate Minor

Students who wish to take a minor in Communication Studies will need to accumulate a minimum of 9 graduate credits in Communication Studies courses. Students are encouraged to contact the Communication Studies Department Chair for directions in the selection of courses.

## Computer Science

Computer Science is the area of study that encompasses all of the theory and practice of computing. The mission of the Department of Computer Science at New Mexico State University is to provide formal education in the core disciplines of computer science, as well as to prepare our graduates for research, development and academic careers. For more information on the Department of Computer Science, please visit the web site [www.cs.nmsu.edu](http://www.cs.nmsu.edu) (<https://www.cs.nmsu.edu>).

## Undergraduate Program Information

The undergraduate computer science programs prepare students for graduate study in computer science and for employment in positions involving the design, construction and application of computer systems. Undergraduate degree programs include a Bachelor of Science (ABET accredited), Bachelor of Arts, and four minor degree tracks. The B.S. degree is the traditional computer science degree program, while the B.A. degree offers a more open, flexible degree plan that is easier to combine with studies in other disciplines. The minors offer specialized tracks in algorithm theory, bioinformatics, computer systems and software development. With technology underpinning almost every area of human endeavor today, students across NMSU should consider pursuing a minor or at least taking some computer science courses. Computer science majors should review their programs of study in consultation with their advisors each semester, preferably using the most recent Undergraduate Catalog.

## Graduate Program Information

The department offers both Master of Science and Doctor of Philosophy graduate degrees in computer science, along with a Master of Science in Bioinformatics. We also encourage students in other disciplines to do a graduate minor in computer science. Graduate students typically work closely with a faculty member in a specific area of research. The department offers expertise in several research areas, such as: artificial intelligence and knowledge representation; computer and wireless networks; data mining and machine learning; game design and human-computer interaction; bioinformatics; high performance computing; software engineering and programming languages; theory of computing; and assistive technologies.

A number of laboratories have been established to coordinate research activities, including

- the Knowledge representation, Logic and Advanced Programming (KLAP) lab,
- the Play and Interactive Experiences for Learning (PiXL) lab,
- the Knowledge Discovery and Data Mining (KDD) lab,
- the Data Storage Lab (DSL),
- the Programming Languages, Environments, and Automated Software Engineering (PLEASE) lab,
- the Bioinformatics Research lab; and
- the Network and Systems Optimization Lab (NSOL).

Department members are also directing the iCREDITS interdisciplinary Center of Research Excellence in Design of Intelligent Technologies for Smartgrids, offering educational and research opportunities in smartgrids.

## Entrance Requirements for Graduate Study in Computer Science

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. To be admitted without undergraduate deficiencies, an entering student must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science degree in Computer Science at New Mexico State University; in particular, this includes courses equivalent to

C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 471	Programming Language Structure I	3
C S 473	Architectural Concepts I	3
C S 474	Operating Systems I	3

Deficiencies should be satisfied as early in the student graduate program as possible, through the regular undergraduate courses, the C S 460 - C S 469 transition courses, or through tests administered by faculty members in the relevant areas. Students should consult with their

Graduate Advisor to address issues related to deficiencies. Deficiencies are also assigned to applicants whose transcripts denote low grades in selected areas. Admission is often denied to candidates with little background in Computer Science. Instructions for prospective applicants can be found at <http://www.cs.nmsu.edu>.

## Entrance Requirements for Graduate Study in Bioinformatics

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. Students wishing to enroll in the Master program in Bioinformatics must meet the following criteria:

1. Hold a BS degree, from an accredited institution of higher learning, in either a computational field (e.g., Computer Science) or in life sciences (preferably Biology, Biochemistry, or Environmental Sciences)
2. Hold a minimum grade point average of 3.2

Applicants will be expected to provide a Career statement, motivating the interest in bioinformatics and a minimum of three letters of reference.

## Graduate Assistantships

Graduate assistantships (in the form of Teaching and Research assistantships) are expected to be available during the academic year. Inquiries should be addressed to the departmental Graduate Committee. Research assistantships are available at the discretion of individual research project leaders in the Department or elsewhere on campus. Submitting detailed vitae, letters of reference, and GRE test scores are encouraged when applying for any assistantship.

## Degrees for the Department

Computer Science - Bachelor of Arts (p. 255)

Computer Science - Bachelor of Science (p. 257)

Computer Science - Bachelor of Science/Master of Science (p. 259)

Bioinformatics - Master of Science (p. 261)

Computer Science - Master of Science (p. 262)

Computer Science - Doctor of Philosophy (p. 263)

## Minors for the Department

A student cannot earn more than one of the undergraduate minors unless they pass at least 6 credits in the second minor beyond the requirements of the first minor. The maximum number of undergraduate minors that a student may earn is two. Most courses for the minors listed below have prerequisites. Please check the undergraduate catalog for individual course prerequisites. Students interested in pursuing a computer science minor are encouraged to pick up more information at the departmental office.

Algorithm Theory - Undergraduate Minor (p. 260)

Bioinformatics - Undergraduate Minor (p. 261)

Computer Systems - Undergraduate Minor (p. 261)

Software Development - Undergraduate Minor (p. 261)

Computer Science - Graduate Minor (p. 264)

## Faculty

**Professor Son Tran, Department Head**

**Professors** Cook, Leung, Pontelli, Song, Tran; **Associate Professors** Cao, Misra, Pivkina; **Assistant Professors** Nagarkar, Touns, Vishnawanathan, Zheng; **College Professors** Cooper, Steiner

*J. Cook, Ph.D. (Colorado)– software engineering, component-based systems; H. Cao, Ph.D. (Hong-Kong)– data mining, databases, data integration; H. Leung, Ph.D. (Penn State)– automata theory; S. Misra, Ph.D. (Arizona State)– communication networks, social networks, high performance computing, security and privacy; I. Pivkina, Ph.D. (Kentucky)– artificial intelligence, computer science education, data mining; E. Pontelli, Ph.D. (New Mexico State)– parallel processing, logic programming, knowledge representation, bioinformatics, assistive technologies; P. Nagarkar, Ph.D. (Arizona State)– query optimization, indexing, data analytics, big data; M. Song, Ph.D. (Washington)– statistical computing, systems biology, bioinformatics, computer vision; Z. Touns, Ph.D. (Texas A&M)– digital games, human-computer interaction, mixed reality; S. Tran, Department Head, Ph.D. (Texas-El Paso)– artificial intelligence, knowledge representation, planning, logic programming, non-monotonic reasoning; R. Vishnawanathan, Ph.D. (North Texas)– cryptography, theoretical and applied, security, privacy; M. Zheng, Ph.D. (Ohio State)– computer systems, storage and file systems, parallel and distributed systems*

### Support Faculty:

*S. Cooper, Ph.D. (New Mexico State)– computer networks; E. Steiner, Ph.D. (Oklahoma State)– computer science education*

## Computer Science Courses

### C S 110. Computer Literacy

#### 3 Credits

This course provides a broad introduction to computing, including computer and information technology concepts; economic and social implications of technology; database management, spreadsheet, word processing, and presentation applications.

### C S 111. Computer Science Principles

#### 4 Credits (3+2P)

This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future.

**Prerequisite(s):** MATH 120 or higher.

### C S 117. Introduction to Computer Animation

#### 3 Credits

Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

### C S 150. C Programming

#### 3 Credits (2+2P)

Programming in the C language. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 120 or higher.

### C S 151. C++ Programming

#### 3 Credits (2+2P)

Introduction to object-oriented programming in the C++ language. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 120 or higher.

### C S 152. Java Programming

#### 3 Credits (2+2P)

Programming in the Java language. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 120 or higher.

### C S 153. Python Programming I

#### 3 Credits

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required.

**Prerequisite(s):** MATH 120 or higher.

### C S 154. Python Programming II

#### 3 Credits

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

**Prerequisite(s):** C S 153 or C S 453.

### C S 155. Internet Programming I

#### 3 Credits

This course is an introduction to programming for the Web in PHP and Javascript, covering fundamental web scripting ideas, CSS, data types and variables, functions, simple object creation and usage. Javascript usage will focus on dynamic page content. No prior programming experience is required, though a basic understanding of HTML will be assumed.

**Prerequisite(s):** MATH 120 and a basic understanding of HTML.

### C S 156. Internet Programming II

#### 3 Credits

This course covers advanced web scripting, including Javascript with AJAX, PHP integration with databases, object oriented features of PHP and Javascript, advanced CSS usage, and using web application frameworks.

**Prerequisite(s):** C S 155 or C S 455.

### C S 157. Topics in Software Programming and Applications

#### 3 Credits (2+2P)

Current topics in computer programming and software applications.

Topic announced in the Schedule of Classes. May be repeated if subtitle is different.

### C S 158. R Programming I

#### 3 Credits

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.

**Prerequisite(s):** MATH 121G.

**C S 159. R Programming II****3 Credits**

This course covers advanced R programming, including advanced data collection processing, advanced data visualizations, object oriented features of R, and file processing. It is recommended that students have one statistics course before taking this course.

**Prerequisite(s):** C S 158 or C S 458.

**C S 171G. Introduction to Computer Science****4 Credits (3+2P)**

Computers are now used widely in all area of modern life. This course provides understanding of the theoretical and practical foundations for how computers work, and provides practical application and programming experience in using computers to solve problems efficiently and effectively. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Weekly labs stress using computers to investigate and report on data-intensive scientific problems. Practical experience in major software applications includes an introduction to programming, word processing, spreadsheets, databases, presentations, and Internet applications.

**Prerequisite(s):** MATH 210G or MATH 120 or higher.

**C S 172. Computer Science I****4 Credits (3+2P)**

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. Crosslisted with: C S 460.

**Prerequisite(s):** MATH 121G or higher; C S 111 or successful placement.

**C S 209. Special Topics.****1-3 Credits**

May be repeated for a maximum of 12 credits.

**C S 271. Object Oriented Programming****4 Credits (3+2P)**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Pointers and dynamic memory allocation. Hands-on experience with useful development tools. May be repeated up to 4 credits.

**Prerequisite(s):** C- or better in C S 172 or E E 112.

**C S 272. Introduction to Data Structures****4 Credits (3+2P)**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms.

**Prerequisite(s):** At least a C- in C S 172, or placement.

**C S 273. Machine Programming and Organization****4 Credits (3+2P)**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages.

**Prerequisite(s):** At least a C- in C S 172 or E E 161.

**C S 278. Discrete Mathematics for Computer Science****4 Credits (3+2P)**

Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. Crosslisted with: MATH 278.

**Prerequisite(s):** At least C- in C S 172.

**C S 343. Algorithm Design & Implementation****3 Credits**

Introduction to efficient data structure and algorithm design. Basic graph algorithms. Balanced search trees. Classic algorithm design paradigms: divide-and-conquer, greedy scheme, and dynamic programming.

**Prerequisite(s):** At least a C- in C S 272, or consent of instructor.

**C S 370. Compilers and Automata Theory****4 Credits (3+2P)**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components.

**Prerequisite(s):** At least a C- in C S 271, C S 272, C S 273, and C S 278.

**C S 371. Software Development****4 Credits (3+2P)**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project.

**Prerequisite(s):** At least a C- in C S 271 and C S 272.

**C S 372. Data Structures and Algorithms****4 Credits (3+2P)**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and red-black trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms.

**Prerequisite(s):** At least a C- in CS 272 and C S 278.

**C S 375. Introduction to Intelligent Agents Using Science Fiction****3 Credits**

This course uses science-fiction movies to introduce fundamental principles and techniques in agents and multi-agent systems. It covers game theory, decision theory, machine learning, and distributed systems.

**C S 409. Independent Study****1-6 Credits (1-6)**

Faculty supervised investigation, to culminate in a written report. May be repeated up to 6 credits.

**Prerequisite(s):** Written agreement with faculty supervisor.

**C S 419. Computing Ethics and Social Implications of Computing****1 Credit**

An overview of ethics for computing majors includes: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems. S/U Grading (S/U, Audit).

**Corequisite(s):** C S 448 or C S 449.

**C S 448. Senior Project****4 Credits**

Capstone course in which C S majors work in teams and apply computer science skills to complete a large project. Consent of Instructor required. Restricted to: C S majors.

**Prerequisite(s):** Senior standing.

**Corequisite(s):** C S 419.

**C S 449. Senior Thesis****4 Credits**

Capstone course in which C S majors apply computer science skills to complete a research project, culminating in a written thesis report. Consent of Instructor required. Restricted to: C S majors.

**Prerequisite(s):** Consent of thesis adviser.

**Corequisite(s):** C S 419.

**C S 450. C Programming****3 Credits (2+3P)**

Programming in the C language. More advanced than C S 150. Recommended for nonmajors only. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**C S 451. C++ Programming****3 Credits**

Programming in the C language. More advanced than C S 151. Recommended for nonmajors only. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**C S 452. Java Programming****3 Credits (2+2P)**

Programming in the Java language. More advanced than C S 152. Recommended for nonmajors only. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**C S 453. Python Programming I****3 Credits**

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. More advanced than C S 153. May be repeated up to 3 credits.

**Prerequisite(s):** Understanding of college algebra or higher.

**C S 454. Python Programming II****3 Credits**

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas. For graduate students only. Has more advanced work than C S 154, and does not count towards CS major requirements. May be repeated up to 3 credits. Graduate standing. Not for CS students.

**Prerequisite(s):** C S 153 or C S 453.

**C S 455. Internet Programming I****3 Credits**

This course is an introduction to programming for the Web in PHP and Javascript, covering fundamental web scripting ideas, CSS, data types and variables, functions, simple object creation and usage. Javascript usage will focus on dynamic page content. No prior programming experience is required, though a basic understanding of HTML will be assumed. For graduate students only. Has more advanced work than C S 155. Does not count towards CS major requirements. May be repeated up to 3 credits. Graduate standing. Not for CS students. Restricted to: exclude CS majors.

**Prerequisite(s):** MATH 120 and a basic understanding of HTML.

**C S 456. Internet Programming II****3 Credits**

This course covers advanced web scripting, including Javascript with AJAX, PHP integration with databases, object oriented features of PHP and Javascript, advanced CSS usage, and using web application frameworks. For graduate students only. Has more advanced work than C S 156. Does not count towards CS major requirements. May be repeated up to 3 credits. Graduate standing. Not for CS students. Restricted to: exclude CS majors.

**Prerequisite(s):** C S 155 or C S 455.

**C S 457. Topics in Software Programming and Applications****3 Credits (2+2P)**

Current topics in computer programming and software applications. Topic announced in the Schedule of Classes. More advanced than C S 157. recommended for non-majors only. May be repeated if subtitle is different.

**Prerequisite(s):** Graduate standing.

**C S 458. R Programming I****3 Credits**

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used. For graduate students only. Has more advanced work than C S 158. Does not count towards CS major requirements. May be repeated up to 3 credits.

**Prerequisite(s):** Good understanding of college algebra or higher.

**C S 459. R Programming II****3 Credits**

This course covers advanced R programming, including advanced data collection processing, advanced data visualizations, object oriented features of R, and file processing. It is recommended that students have one statistics course before taking this course. For graduate students only. Has more advanced work than C S 159, and does not count towards CS major requirements. May be repeated up to 3 credits. Crosslisted with: C S 469. Graduate standing. Restricted to: exclude computer science majors.

**Prerequisite(s):** C S 158 or C S 458.

**C S 460. Computer Science I Transition****3 Credits**

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For C S graduate students only; cannot be used to meet a C S student's program of study. Taught with C S 172. Consent of Instructor required. Crosslisted with: C S 172.

**C S 462. Object Oriented Programming Transition****3 Credits**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 463. Introduction to Data Structures Transition****3 Credits**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 464. Machine Programming and Organization Transition****3 Credits**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 465. Discrete Math for Computer Science Transition****3 Credits**

Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 466. Compilers and Automata Transition****3 Credits**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required.

**Prerequisite(s):** At least a C in C S 271 or C S 462, in C S 272 or C S 463, in C S 273 or C S 464, in C S 278 or C S 465, or consent of instructor.

**C S 468. Software Development Transition****3 Credits**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 271 or C S 462, in C S 272 or C S 463, or consent of instructor.

**C S 469. Data Structure and Algorithms Transition****3 Credits**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and red-black trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required. Restricted to: C S majors.

**Prerequisite(s):** At least a C- in C S 272 or C S 463, in C S 278 or C S 465, or consent of instructor.

**C S 471. Programming Language Structure I****3 Credits**

Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for C S graduate students.

**Prerequisite(s):** C- or better in C S 370 and C S 371.

**C S 473. Architectural Concepts I****3 Credits**

Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 273 and C S 370.

**C S 474. Operating Systems I****3 Credits**

Operating system principles and structures, and interactions with architectures. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 273, C S 371, and C S 372.

**C S 475. Artificial Intelligence I****3 Credits**

Fundamental principles and techniques in artificial intelligence systems. Intelligent Agents; solving problems by searching; local search techniques; game-playing agents; constraint satisfaction problems; knowledge representation and reasoning. Further selected topics may also be covered. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 476. Computer Graphics I****3 Credits**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for C S graduate students.

**Prerequisite(s):** At least C- in C S 370 or C S 371.

**C S 477. Digital Game Design****3 Credits**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Not for C S graduate students. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C S 371 or consent of instructor.

**C S 478. Computer Security****3 Credits**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. May be repeated up to 3 credits.

**Prerequisite(s):** At least a C- in C S 272, C S 273 or consent of instructor.

**C S 479. Special Topics****1-6 Credits**

Topic announced in the Schedule of Classes. May be repeated if subtitle is different. Not for C S graduate students. May be repeated up to 6 credits.

**C S 480. Linux System Administration****3 Credits**

Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.

**C S 481. Visual Programming****3 Credits**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Not for C S graduate students.

**Prerequisite(s):** C- or better in C S 272 and C S 278.

**C S 482. Database Management Systems I****3 Credits**

Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 483. Introduction to Robotics****3 Credits**

Basic AI-based robotic architecture and concepts, with an emphasis on building and programming mobile robots. Not for C S graduate students. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 272 and C S 273.

**C S 484. Computer Networks I****3 Credits**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for C S graduate students. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 272 and CS 273.

**C S 485. User Interface Design****3 Credits**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Not for C S graduate students. May be repeated up to 3 credits.

**Prerequisite(s):** At least C- in C S 371.

**C S 486. Bioinformatics****3 Credits**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 487. Applied Machine Learning I****3 Credits**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Not for Graduate Majors. Crosslisted with: C S 519.

**Prerequisite(s):** At least a C- in C S 272, MATH 191G; or consent of instructor.

**C S 488. Introduction to Data Mining****3 Credits**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Taught with C S 508.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 489. Bioinformatics Programming****3 Credits**

Application of computer programming languages to address data processing and analysis problems in modern molecular biology. R/Perl/Python programming; Web API programming. Automatic manipulation of next generation sequence data, analysis of large gene expression tables, access to online biological databases, performing statistical analysis, and visualization of data and results. Taught with C S 509.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 491. Parallel Programming****3 Credits**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for C S graduate students.

**Prerequisite(s):** C- or better in C S 370 or consent of instructor.

**C S 493. Algorithm Design and Implementation****3 Credits**

This course introduces the basic knowledge of designing classical algorithms and implementing these algorithms using a programming language. In particular, the course teaches various data structures, including graphs and balanced binary search trees, and efficient schemes to implement these data structures. This course also teaches basic algorithm design techniques including divide-and-conquer, greedy scheme, and dynamic programming. This course covers graph algorithms, including graph traversals (depth-first search and breadth-first search), connectivity, shortest paths, and minimum spanning trees. May be repeated up to 3 credits. Graduate standing. Not for CS students. Restricted to: C S majors.

**Prerequisite(s):** At least a C- in C S 272, or Consent of Instructor.

**C S 494. Introduction to Smart Grids****3 Credits**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids.

**Prerequisite(s):** At least a C- in C S 272 and a C- in E E 201 or 280; or Consent of instructor.

**C S 496. Cloud and Edge Computing****3 Credits**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Not for graduate CS majors. Crosslisted with: C S 522.

**Prerequisite(s):** A C- in C S 372; background in C S 484/504 is preferred or consent of instructor.

**C S 502. Database Management Systems I****3 Credits**

Database design and implementation; models of database management systems; privacy, security, protection, recovery; requires more advanced graduate work than C S 482. Students are expected to have solid knowledge of data structures and discrete mathematics.

**C S 503. Introduction to Robotics****3 Credits**

Basic AI-based robotic architectures and concepts, with an emphasis on building and programming mobile robots; requires more advanced graduate work than C S 483. Students are expected to have solid knowledge of data structures and machine-level programming.

**C S 504. Computer Networks I****3 Credits**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; requires more advanced graduate work than C S 484. Students are expected to have solid knowledge of data structures, machine-level programming. Knowledge of statistics (at the level of STAT 371 or 470) is recommended.

**C S 505. Artificial Intelligence I****3 Credits**

Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; requires more advanced graduate work than C S 475. Students are expected to have strong knowledge of algorithms and data structures (at the level of C S 372).

**C S 506. Computer Graphics I****3 Credits**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Requires more advanced graduate work than C S 476. Students are expected to have knowledge of compilers design and software engineering equivalent to CS 370 and CS 371.

**C S 508. Introduction to Data Mining****3 Credits**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Students are expected to have a preparation in Discrete Mathematics and Data Structures equivalent to C S 272 and C S 278. Requires more advanced graduate work than C S 488. Crosslisted with: C S 488.

**C S 509. Bioinformatics Programming****3 Credits**

Application of computer programming languages to address data processing and analysis problems in modern molecular biology. R/Perl/Python programming; Web API programming. Automatic manipulation of next generation sequence data, analysis of large gene expression tables, access to online biological databases, performing statistical analysis, and visualization of data and results. Requires a preparation in discrete mathematics and data structures equivalent to C S 272 and C S 278. Taught with C S 489.

**C S 510. Automata, Languages, Computability****3 Credits**

Regular and context-free languages, pushdown and finite-slate automata, turing machines, models of computation, halting problems. Students are expected to have knowledge of compilers design and algorithms equivalent to C S 370 and C S 372.

**C S 511. Logic and Constraint Logic Programming****3 Credits**

Declarative programming techniques; foundations of logic programming; programming in Prolog; constraint logic programming; application of logic and constraint programming; requires more advanced graduate work than C S 472. Students are expected to have knowledge of data structures and discrete mathematics equivalent to C S 272 and C S 278.

**C S 512. Computer Systems Modeling and Simulation****3 Credits**

Basic concepts of modeling computer systems: continuous and discrete time models, states and transition, probabilistic models. Structures of simulation programs, time driven and event driven simulation, simulation on captured and synthetic traces, generation of random variables, queuing models, Markov chains, random walks, Poisson, Markov, renewal branching and Brownian motion processes, model validation and data analysis; requires more advanced graduate work than C S 492. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

**C S 513. Computer Security****3 Credits**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Recommended knowledge of materials in C S 272 and C S 273. May be repeated up to 3 credits.

**Prerequisite(s):** At least a C in C S 273 or consent of instructor.

**C S 514. Introduction to Smart Grids****3 Credits**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Requires more advanced work than C S 494.

**Prerequisite(s):** At least a C- in C S 272 and a C- in E E 201 or 280; or Consent of instructor.

**C S 515. User Interface Design****3 Credits**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Requires more advanced graduate work than C S 485 with an emphasis on studying recent research in human-computer interaction. Students are expected to have knowledge of software engineering equivalent to C S 371. May be repeated up to 3 credits.

**C S 516. Bioinformatics****3 Credits**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; requires more advanced graduate work than C S 486. Students are expected to have a knowledge of algorithms and data structures equivalent to C S 372 or exposure to Biology (equivalent to BIOL 221 or BIOL 311).

**C S 517. Digital Game Design****3 Credits**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Requires more advanced graduate work than C S 477 with deeper attention to a team game project. May be repeated up to 3 credits.

**C S 518. Visual Programming****3 Credits**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Requires more advanced graduate work than C S 481. May be repeated up to 3 credits.

**Prerequisite(s):** at least a C in C S 272 and C S 278.

**C S 519. Applied Machine Learning I****3 Credits**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Crosslisted with: C S 487.

**C S 521. Parallel Programming****3 Credits**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; requires more advanced graduate work than C S 491. Students are expected to have knowledge of programming and machine organization equivalent to C S 271 and C S 273.

**C S 522. Cloud and Edge Computing****3 Credits**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Might have additional requirements for graduate students. Crosslisted with: C S 496.

**Prerequisite(s):** background in C S 484/504 is preferred or consent of instructor.

**C S 570. Analysis of Algorithms****3 Credits**

Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

**C S 571. Programming Language Structure II****3 Credits**

Formal semantics of programming languages. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372, and knowledge of principles of programming languages equivalent to C S 471.

**C S 572. Advanced Algorithms****3 Credits**

Design, analysis, and use of important algorithms and data structures.

**Prerequisite:** C S 570 or consent of instructor.

**C S 573. Architectural Concepts II****3 Credits**

Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474. Crosslisted with: E E564.

**C S 574. Operating Systems II****3 Credits**

Advanced topics related to operating system principles, guided by the current literature. Students are expected to have knowledge of computer architectures and operating systems equivalent to C S 473 and C S 474.

**C S 575. Artificial Intelligence II****3 Credits**

Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Students are expected to have knowledge of artificial intelligence equivalent to C S 475.

**C S 579. Special Topics****1-6 Credits**

Topic announced in the Schedule of Classes.

**C S 581. Advanced Software Engineering****3 Credits**

Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures, templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Students are expected to have knowledge of software engineering equivalent to C S 371.

**C S 582. Database Management Systems II****3 Credits**

Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Students are expected to have knowledge of data base management systems equivalent to CS 482.

**C S 584. Computer Networks II****3 Credits**

Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Students are expected to have knowledge of computer networks equivalent to C S 484, and of statistics equivalent to STAT 371 or STAT 470.

**C S 586. Algorithms in Systems Biology****3 Credits**

The course will introduce important algorithms and computational models used in systems biology to study molecular mechanisms for cellular dynamics, processes, and systems. Cellular processes, such as metabolism and signal transduction, are studied as systems and networks quantitatively from high throughput molecular measurements. The topics include molecular biological systems, network alignment, model simulation, network inference, model optimization, and hybrid models. Students will be able to construct models and analyze their properties in the context of molecular biological systems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

**C S 589. Special Research Problems****1-6 Credits**

Faculty-supervised investigation, to culminate in a written report. May be repeated; maximum of 6 credits may be applied toward M.S. degree. Restricted to majors.

**Prerequisite:** written agreement with faculty supervisor.

**C S 598. Master's Project****1-6 Credits**

Project-oriented capstone course to be completed by M.S. students under supervision of their advisor. Maximum of 6 credits may be applied toward M.S. degree. Restricted to C S majors.

**Prerequisite:** written agreement with instructor.

**C S 599. Master's Thesis****1-6 Credits (1-6)**

Thesis to be developed by M.S. Students under supervision of their advisor. May be repeated for a maximum of 6 credits. Restricted to majors.

**Prerequisite:** consent of instructor.

**C S 600. Pre-dissertation Research****1-15 Credits**

Pre-dissertation research.

**C S 700. Doctoral Dissertation****1-15 Credits**

Dissertation.

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## Computer Science - Bachelor of Arts

The Bachelor of Arts in Computer Science is an open, flexible degree plan that offers the student both a rigorous undergraduate degree program in Computer Science and an extensive open credit hour allotment to pursue knowledge in other domains. It is an excellent choice to combine into a double major program, and is an option for the student who has an interest in learning both domain knowledge in some areas outside of Computer Science, and in acquiring a Computer Science background sufficient to pursue a strong technology career.

Students planning to undertake graduate work in Computer Science are encouraged to pursue the Bachelor of Science degree rather than the Bachelor of Arts degree. Students interested in graduate work should consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

## General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

## Requirements

<b>General Education Requirements</b>	35
<b>Viewing a Wider World</b>	6
<b>Departmental Requirements</b>	
C S 172                      Computer Science I	4

C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448	Senior Project	4
or C S 449	Senior Thesis	
C S 482	Database Management Systems I	3

### Computer Science Electives

#### List 1:

Select 6-7 credits from the following: <sup>1</sup>	6-7
C S 343	Algorithm Design & Implementation
or C S 372	Data Structures and Algorithms
C S 471	Programming Language Structure I
C S 473	Architectural Concepts I
C S 474	Operating Systems I
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 477	Digital Game Design
C S 478	Computer Security
C S 479	Special Topics <sup>2</sup>
C S 480	Linux System Administration
C S 481	Visual Programming
C S 483	Introduction to Robotics
C S 484	Computer Networks I
C S 485	User Interface Design
C S 486	Bioinformatics
C S 487	Applied Machine Learning I
C S 488	Introduction to Data Mining
C S 489	Bioinformatics Programming
C S 491	Parallel Programming
C S 494	Introduction to Smart Grids
C S 496	Cloud and Edge Computing

#### List 2:

Select 6 credits from the following: <sup>1</sup>	6
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 477	Digital Game Design
C S 478	Computer Security
C S 479	Special Topics <sup>2</sup>
C S 480	Linux System Administration
C S 481	Visual Programming
C S 483	Introduction to Robotics
C S 484	Computer Networks I
C S 485	User Interface Design
C S 486	Bioinformatics
C S 487	Applied Machine Learning I
C S 488	Introduction to Data Mining

C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 494	Introduction to Smart Grids	
C S 496	Cloud and Edge Computing	
<b>Non-departmental Requirements</b>		
Select two upper-division courses in any one department except Computer Science		6-8
Select upper division electives to bring total upper division to 48		
Select electives as needed to meet minimum credit requirements		
Select one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
HON 265G	Principles of Human Communication Honors	
Select one from the following:		3
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Select 3-4 credits from the following:		3-4
MATH 142G	Calculus for the Biological and Management Sciences	
MATH 235	Calculus for the Technical Student I	
MATH 191G	Calculus and Analytic Geometry I	
Select one from the following:		3
STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
A ST 251G	Statistics for Business and the Behavioral Sciences	
A ST 311	Statistical Applications	
<b>Electives (to bring total to 120)</b>		<b>13</b>
<b>Second Language Requirement: (not required)</b>		
Total Credits		120-124

<sup>1</sup> A course can satisfy only one requirement.

<sup>2</sup> Must be taken for 3 credits to count as one course.

Students who plan to seek employment at the bachelor level are advised to take one of the focus area curricula in addition to the general and departmental requirements. The program of study should be chosen by the student in consultation with an advisor. The list of possible focuses can be found on the Bachelor of Sciences in Computer Science (<https://catalogs.nmsu.edu/nmsu/arts-sciences/computer-science/computer-science-bachelor-science>) link.

## Second Language Requirement

For the Bachelor of Arts with a major in Computer Science, there is no second language requirement for the degree.

## A Suggested Plan of Study For Students

Course	Title	Credits
<b>Freshman</b>		
C S 111	Computer Science Principles	4
ENGL 111G	Rhetoric and Composition	4
MATH 121G	College Algebra	3
COMM 265G	Principles of Human Communication	3
C S 172	Computer Science I	4
MATH 190G	Trigonometry and Precalculus	4
Area III: Laboratory Science		4
Area IV: Social/ Behavioral Sciences		3
Electives as needed to meet minimum credit requirements <sup>3</sup>		1-3
Credits		30-32
<b>Sophomore</b>		
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
Area IV: Social/ Behavioral Sciences		3
Area V: Humanities and Fine Arts		3
Electives as needed to meet minimum credit requirements <sup>3</sup>		2-3
Select 3-4 credits from the following:		3-4
MATH 142G	Calculus for the Biological and Management Sciences	
MATH 235	Calculus for the Technical Student I	
MATH 191G	Calculus and Analytic Geometry I	
Select one from the following:		3
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Credits		30-32
<b>Junior</b>		
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
Area III: Laboratory Science		4
C S elective, List 1 <sup>3</sup>		3
C S elective, List 1 <sup>3</sup>		3
Upper division from another department		3-4
Viewing a Wider World		3
Area IV & Area V		3
Select one from the following:		3
STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
A ST 251G	Statistics for Business and the Behavioral Sciences	
A ST 311	Statistical Applications	
Credits		30-31

<b>Senior</b>		
C S 482	Database Management Systems I	3
C S electives, List 2 <sup>3</sup>		6
Upper division from another department		3-4
Viewing a Wider World		3
Area V: Humanities and Fine Arts		3
C S 448	Senior Project	4
C S 419	Computing Ethics and Social Implications of Computing	1
Upper division electives to bring total upper division to 48 <sup>3</sup>		3-7
Electives as needed to meet minimum credit requirements <sup>3</sup>		4-7
	<b>Credits</b>	<b>30-38</b>
	<b>Total Credits</b>	<b>120-133</b>

<sup>3</sup> For electives see lists above.

## Computer Science - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

### General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

### Requirements

General Education Requirement		27
Viewing a Wider World		6
<b>Departmental Requirements</b>		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448	Senior Project	4
or C S 449	Senior Thesis	
C S 471	Programming Language Structure I	3

C S 473	Architectural Concepts I	3
C S 474	Operating Systems I	3
Select 6 credits from the following: <sup>1</sup>		6
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics <sup>2</sup>	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 482	Database Management Systems I	
C S 483	Introduction to Robotics	
C S 484	Computer Networks I	
C S 485	User Interface Design	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 494	Introduction to Smart Grids	
C S 496	Cloud and Edge Computing	

#### Non-departmental Requirements

MATH 280	Introduction to Linear Algebra	3
or MATH 480	Matrix Theory and Applied Linear Algebra	
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
Select one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
HON 265G	Principles of Human Communication Honors	
Select one from the following:		3
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	

Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Mathematical Logic	
MATH 455	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

#### Lab Science Courses

List 1:		
Select two from the following: <sup>1</sup>		8
ASTR 110G	Introduction to Astronomy	

BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
GEOG 111G	Geography of the Natural Environment	
GEOL 111G	Introductory Geology	
HON 205G	Life, Energy, and Evolution	
HON 219G	Earth, Time, and Life	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory	
PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	
List 2:		
Select one from the following: <sup>1</sup>		4
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
HON 205G	Life, Energy, and Evolution	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
PHYS 213 & 213 L	Mechanics and Experimental Mechanics	
PHYS 214 & 214 L	Electricity and Magnetism and Electricity and Magnetism Laboratory	
PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory	
PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	
<b>Second Language Requirements: (not required)</b>		
Total Credits		120

<sup>1</sup> A course can satisfy only one requirement.

<sup>2</sup> Must be taken for 3 credits to count as a course.

## Second Language Requirement

For the Bachelor of Science with a major in Computer Science (including all Focus Areas), there is no second language requirement for the degree.

## Focus Areas

Students who plan to seek employment at the bachelor level are advised to take one of the focus area curricula in addition to the general and

departmental requirements. An elective course cannot be used for more than two focuses. Below are the list of possible focuses.

### Focus: Algorithm Theory

<b>Select 3-4 credits from the following:</b>		3-4
C S 372	Data Structures and Algorithms	
C S 343	Algorithm Design & Implementation	
<b>Select 6 credits from the following:</b>		6
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 488	Introduction to Data Mining	
Total Credits		9-10

### Focus: Artificial Intelligence

<b>Select 6-7 credits from the following:</b>		3-4
C S 372	Data Structures and Algorithms	
C S 343	Algorithm Design & Implementation	
C S 475	Artificial Intelligence I	
<b>Select 3 credits from the following:</b>		6
C S 487	Applied Machine Learning I	
C S 483	Introduction to Robotics	
Total Credits		9-10

### Focus: Big Data and Data Science

<b>Required course:</b>		7
C S 371	Software Development	
C S 482	Database Management Systems I	
<b>Select 3 credits from the following:</b>		6
C S 488	Introduction to Data Mining	
C S 487	Applied Machine Learning I	
Total Credits		13

### Focus: Bioinformatics

<b>Select one of the following:</b>		3-4
C S 343	Algorithm Design & Implementation	
C S 372	Data Structures and Algorithms	
<b>Required courses:</b>		6
C S 486	Bioinformatics	
C S 489	Bioinformatics Programming	
Total Credits		9-10

### Focus: Cybersecurity

<b>Required courses</b>		6
C S 473	Architectural Concepts I	
C S 478	Computer Security	
<b>Select 3 credits from the following:</b>		3
C S 479	Special Topics <sup>Topics in Cryptography</sup>	
C S 484	Computer Networks I	
Total Credits		9

### Focus: Networking

<b>Required courses:</b>		6
C S 473	Architectural Concepts I	

C S 484	Computer Networks I	
<b>Select 3 credits form the following:</b>		<b>3</b>
C S 480	Linux System Administration	
C S 478	Computer Security	
C S 496	Cloud and Edge Computing	
Total Credits		9

**Focus: Human Computer Interaction**

<b>Required courses:</b>		<b>7</b>
C S 371	Software Development	
C S 485	User Interface Design	
<b>Select 3 credits from the following:</b>		<b>3</b>
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 481	Visual Programming	
Total Credits		10

**Focus: Software Development**

<b>Required course:</b>		<b>4</b>
C S 371	Software Development	
<b>Select 6 credits from the following:</b>		<b>6</b>
C S 476	Computer Graphics I	
C S 484	Computer Networks I	
C S 482	Database Management Systems I	
C S 485	User Interface Design	
C S 491	Parallel Programming	
Total Credits		10

**A Suggested Plan of Study for Students**

The following plan applies to students who qualify to take MATH 191G Calculus and Analytic Geometry I.

Course	Title	Credits
<b>Freshman</b>		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 111G	Rhetoric and Composition	4
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
Area IV: Social/ Behavioral Sciences <sup>3</sup>		3
Area V: Humanities and Fine Arts <sup>3</sup>		3
Credits		30
<b>Sophomore</b>		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 265G	Principles of Human Communication	3
ENGL 218G	Technical and Scientific Communication	3

MATH 280	Introduction to Linear Algebra	3
or MATH 480	or Matrix Theory and Applied Linear Algebra	
Area IV: Social/ Behavioral Sciences <sup>3</sup>		3
Area V: Humanities and Fine Arts <sup>3</sup>		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Credits		34

**Junior**

C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 473	Architectural Concepts I	3
Computer Science 400-level Elective		3
MATH elective (upper division) <sup>4</sup>		3
Lab Science Elective <sup>4</sup>		4
Lab Science Elective <sup>4</sup>		4
Area IV & Area V <sup>3</sup>		3
Viewing a Wider World		3
Viewing a Wider World		3
Credits		33

**Senior**

C S 448	Senior Project	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective <sup>4</sup>		4
Computer Science 400-level Elective <sup>4</sup>		3
Upper division electives to bring total upper division to 48 <sup>4</sup>		4
Electives as needed to meet minimum credit requirements <sup>4</sup>		4
Credits		23
Total Credits		120

<sup>3</sup> AREA IV: Social/ Behavioral Sciences and AREA V: Humanities and Fine Arts: New Mexico State Common Core Requirements (<http://nmsu-preview.courseleaf.com/nmsu/arts-sciences/computer-science/computer-science-bachelor-science>)

<sup>4</sup> For electives see lists above.

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

**Computer Science - Bachelor of Science/Master of Science**

**5 Year Dual Degree BS+MS Program**

The dual degree program combines some of the requirements of the Bachelor of Science (BS) and the Master of Science (MS) in Computer Science. It is very important for the student to apply to the BS+MS program before they take any 400-level C S courses. Full details of the program can be found at <http://www.cs.nmsu.edu>.

Admission occurs in two steps.

1. First, students will apply to the Computer Science department to receive approval for the BS+MS program. The student submits the pre-application when he/she is within 48 credits of earning a BS in Computer Science; an application form is provided on the department website. Qualification for the BS+MS program will be based on the cumulative (non-grade replaced) grade point average in Computer Science and Math courses taken up to that point (at least 3.5), including at least two of the following: C S 370 Compilers and Automata Theory, C S 371 Software Development and C S 372 Data Structures and Algorithms, and recommendations by faculty members listed on the departmental application. Additional factors might be taken into account when available (e.g., GRE scores). Students having a grade point average below 3.5 may be admitted to the combined program on a case-by-case basis, depending on faculty recommendations and evaluations of the individual academic and professional history.
2. Once the Computer Science department has notified the applicant of acceptance in the combined BS+MS program, the applicant must then formally apply to the graduate school (prospective.nmsu.edu/graduate (<http://prospective.nmsu.edu/graduate>)) for formal admission to the graduate program. This application to the graduate school is made during the semester of graduation from the BS in Computer Science.

The curriculum for the first three years of the BS+MS program coincides with the requirements of the BS program. In particular, the general requirements include a grade of at least a C- in each course satisfying the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and non-departmental requirement. No course taken to satisfy either a departmental or non-departmental requirement may be taken S/U. The following are the departmental requirements for the degree (the non-departmental requirements are identical to those of the BS in Computer Science).

#### Departmental Requirements for Years 1 through 4

C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 449 or C S 448	Senior Thesis Senior Project	4
C S 471	Programming Language Structure I	3
C S 473	Architectural Concepts I	3
C S 474	Operating Systems I	3
Select one from the following:		3
C S 502	Database Management Systems I	
C S 503	Introduction to Robotics	
C S 504	Computer Networks I	
C S 505	Artificial Intelligence I	
C S 506	Computer Graphics I	

C S 508	Introduction to Data Mining	
C S 509	Bioinformatics Programming	
C S 511	Logic and Constraint Logic Programming	
C S 512	Computer Systems Modeling and Simulation	
C S 513	Computer Security	
C S 514	Introduction to Smart Grids	
C S 515	User Interface Design	
C S 516	Bioinformatics	
C S 517	Digital Game Design	
C S 518	Visual Programming	
C S 519	Applied Machine Learning I	
C S 521	Parallel Programming	
C S 522	Cloud and Edge Computing	
Select one from the following:		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 584	Computer Networks II	
<b>Departmental Requirements for Year 5</b>		
C S 510	Automata, Languages, Computability	3
C S 570	Analysis of Algorithms	3
One additional course numbered 550 or above		3
One additional course numbered 500 or above		3
C S 599	Master's Thesis <sup>1</sup>	6
or C S 598	Master's Project	
Select one from the following:		3
C S 571	Programming Language Structure II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
Select one from the following:		3
C S 571	Programming Language Structure II	
C S 572	Advanced Algorithms	
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
C S 584	Computer Networks II	
C S 586	Algorithms in Systems Biology	
Total Credits		76

<sup>1</sup> In order to fulfill the degree requirement, the student must complete a total of 6 credits for either course.

## Algorithm Theory - Undergraduate Minor

#### Required Courses

C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 372	Data Structures and Algorithms	4

Select 3-4 credits from the following:	3-4
C S 278	Discrete Mathematics for Computer Science
MATH 279	Introduction to Higher Mathematics
Select 6-7 credits from the following:	6-7
C S 370	Compilers and Automata Theory
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
MATH 377	Introduction to Numerical Methods
MATH 454	Mathematical Logic
Total Credits	25-27

## Bioinformatics - Undergraduate Minor

### Required Courses

BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
C S 172	Computer Science I	4
C S 272	Introduction to Data Structures	4
C S 371	Software Development	4
C S 486	Bioinformatics	3
C S 489	Bioinformatics Programming	3
Select one from the following:	3	
C S 482	Database Management Systems I	
C S 491	Parallel Programming	
BIOL 305	Principles of Genetics	
CHEM 433	Physical Chemistry I	
MATH 331	Introduction to Modern Algebra	
PHYS 315	Modern Physics	
Total Credits		25

## Computer Systems - Undergraduate Minor

### Required Courses

C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 370	Compilers and Automata Theory	4
or C S 371	Software Development	
C S 473	Architectural Concepts I	3
or C S 474	Operating Systems I	
Select one from the following:	3	
C S 476	Computer Graphics I	
C S 482	Database Management Systems I	
C S 484	Computer Networks I	
C S 480	Linux System Administration	
C S 491	Parallel Programming	
Total Credits		26

## Software Development - Undergraduate Minor

### Required Courses

C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 371	Software Development	4
Select 6-7 credits from the following:	6-7	
C S 370	Compilers and Automata Theory	
C S 471	Programming Language Structure I	
C S 474	Operating Systems I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 482	Database Management Systems I	
C S 484	Computer Networks I	
C S 485	User Interface Design	
C S 491	Parallel Programming	
Total Credits		22-23

## Bioinformatics - Master of Science

The degree requirements include 30 graduate credit hours. The requirements are structured as follows:

### Introductory Courses

Select Computational or Life Sciences Track <sup>1</sup>	9
<i>Computational Track</i> <sup>2</sup>	
C S 462	Object Oriented Programming Transition
C S 468	Software Development Transition
C S 469	Data Structure and Algorithms Transition
<i>Life Sciences Track</i> <sup>3</sup>	
C S 508	Introduction to Data Mining
C S 570	Analysis of Algorithms
C S 581	Advanced Software Engineering

### Core Courses <sup>4</sup>

C S 509	Bioinformatics Programming	3
C S 586	Algorithms in Systems Biology	3
Select one from the following:	3	
C S 516	Bioinformatics	
GENE 452	Applied Bioinformatics	
BIOL 566	Advanced Bioinformatics and NCBI Database	

### Elective Courses

Select 6 credits from the following: <sup>5</sup>	6
A ST 505	Statistical Inference I
A ST 506	Statistical Inference II
AGRO 506	Plant Genetics
BCHE 542	Biochemistry I
BCHE 546	Biochemistry II
BCHE 649	Topics in Biochemistry
BIOL 474	Immunology
BIOL 475	Virology

BIOL 478	Molecular Biology of Microorganisms	
BIOL 490	Neurobiology	
BIOL 520	Molecular Cell Biology	
BIOL 566	Advanced Bioinformatics and NCBI Database	
C S 502	Database Management Systems I	
C S 505	Artificial Intelligence I	
C S 508	Introduction to Data Mining	
C S 516	Bioinformatics	
C S 521	Parallel Programming	
C S 570	Analysis of Algorithms	
C S 572	Advanced Algorithms	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
GENE 452	Applied Bioinformatics	
GENE 486	Genes and Genomes	
GENE 488	Gene Regulation	
HORT 506	Plant Genetics	
MOLB 542	Biochemistry I	
MOLB 546	Biochemistry II	
MOLB 590	Discussions in Molecular Biology	
<b>Master's Project / Thesis</b>		
C S 598	Master's Project <sup>6</sup>	6
or C S 599	Master's Thesis	
Total Credits		30

<sup>1</sup> These courses provide foundational preparation in biological sciences and computational sciences.

<sup>2</sup> These courses are intended for students with a Bachelor's degree in life sciences.

<sup>3</sup> These courses are intended for students with a Bachelor's degree in computer sciences. These courses can be replaced by more advanced courses with written permission of the graduate advisor.

<sup>4</sup> The goal of these courses is to expose the students to the central issues and techniques in the field of bioinformatics.

<sup>5</sup> The goal of these courses is to allow students to specialize in a specific branch of bioinformatics.

<sup>6</sup> Each master's student must write a thesis (C S 599 Master's Thesis) or, with the advisor's permission, undertake a research project (C S 598 Master's Project). In either case, the number of required graduate credits is 6 for the thesis or project. In all cases, the students are required to sustain a final exam, covering the thesis/research project.

## Computer Science - Master of Science

Each master's student normally must write a thesis (C S 599 Master's Thesis) or, with the advisor's permission, undertake a research project (C S 598 Master's Project). In either case, the number of required graduate credits is 33, including 6 for the thesis or project. In all cases, the students are required to sustain a final exam, covering the thesis/research project and the graduate course-work. The two parts of the exam bring equal weight.

In no case may a C S course numbered below 500 be counted towards the required number of credits. In particular, graduate students are expected to register for C S classes numbered 500 or above.

### Degree Requirements

C S 510	Automata, Languages, Computability	3
C S 570	Analysis of Algorithms	3
Select one from the following:		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 584	Computer Networks II	
Select one from the following:		3
C S 571	Programming Language Structure II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
Select one from the following:		3
C S 571	Programming Language Structure II	
C S 572	Advanced Algorithms	
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
C S 584	Computer Networks II	
C S 586	Algorithms in Systems Biology	
Select one Computer Science course numbered above 550 and different from the following:		3
C S 598	Master's Project	
C S 599	Master's Thesis	
C S 600	Pre-dissertation Research	
C S 700	Doctoral Dissertation	
C S courses above 500 or other pre-approved graduate courses		9
<b>Thesis / Non-Thesis</b>		
C S 599	Master's Thesis <sup>1</sup>	6
or C S 598	Master's Project	
Total Credits		33

<sup>1</sup> Each master's student normally must write a thesis (C S 599 Master's Thesis) or, with the advisor's permission, undertake a research project (C S 598 Master's Project). In either case, the number of required graduate credits is 33, including 6 for the thesis or project.

Courses not in Computer Science can be included in the student's program of study only if prior written approval has been obtained from the student's advisor and the departmental Graduate Committee. Further details can be found in the on-line Graduate Handbook (<http://www.cs.nmsu.edu/>).

## Course-work Only - Master of Science Degree

With the advisor's consent, the student may instead complete a coursework-only Master degree; this requires 36 credits of regular course work, satisfying the same requirements listed above, except that

the 6 credits of thesis or project are replaced by 9 credits of courses numbered 550 or above and distinct from C S 589 Special Research Problems, C S 598 Master's Project, and C S 599 Master's Thesis. Students pursuing a coursework-only degree are expected to complete an oral exam covering a selected subset of the students' plan of study. Further details can be found in the on-line Graduate Handbook (<http://www.cs.nmsu.edu/>)

**Degree Requirements**

C S 510	Automata, Languages, Computability	3
C S 570	Analysis of Algorithms	3
Select one from the following:		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 584	Computer Networks II	
Select one from the following:		3
C S 571	Programming Language Structure II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
Select one from the following:		3
C S 571	Programming Language Structure II	
C S 572	Advanced Algorithms	
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
C S 584	Computer Networks II	
C S 586	Algorithms in Systems Biology	
Select one Computer Science course numbered above 550 and different from the following:		3
C S 598	Master's Project	
C S 599	Master's Thesis	
C S 600	Pre-dissertation Research	
C S 700	Doctoral Dissertation	
Select 9 credits from Computer Science courses numbered above 550 and different from the following:		9
C S 589	Special Research Problems	
C S 598	Master's Project	
C S 599	Master's Thesis	
C S courses above 500 or other pre-approved graduate courses		9
<b>Total Credits</b>		<b>36</b>

## Computer Science - Doctor of Philosophy

Doctoral students may specialize in any of the areas in which computer science faculty members have active research interests. Through interdisciplinary arrangements with other doctoral departments at New Mexico State University, doctoral students may also specialize in such areas as computational biology, computer networks and architectures and cognitive science.

Doctoral students are expected to join the program with a preparation equivalent to that required for the Master's degree in computer science at New Mexico State University. The requirements for the degree are as specified in the NMSU graduate catalog, with the following additional considerations:

- The qualifying examination consists of written exams in four subject areas:
  - Operating Systems or Computer Architectures;
  - Principles of Programming Languages;
  - Design and Analysis of Algorithms and Data Structures; and
  - Discrete Mathematics.
- The student is required to take the qualifying examination at the end of the first semester of enrollment as a doctoral student at NMSU; the only exceptions will be granted to students entering the doctoral program with significant undergraduate deficiencies—in such case the deadline for the qualifying examination will be indicated in the admission records. It is the responsibility of the student to ensure that the qualifying examination is taken within the prescribed deadline. Students failing to meet the deadline will be automatically withdrawn from the doctoral program. If a student fails any of the exams, they must retake those exams in the following semester. If a student fails to pass all exams after the second attempt, they will be dismissed from the doctoral program.
- The comprehensive examination evaluates depth of knowledge in the specific research area selected by the candidate with the consent of their graduate committee. It includes: a written part, in the form of an extensive survey paper; an annotated bibliography; and an oral examination.
- The student is required to submit and defend a prospectus, at the same time or after completing the comprehensive examination. The prospectus describes and motivates the specific research problem to be addressed in the doctoral dissertation.
- A PhD student is required to take at least one course each in the following three areas (foundations, systems, or applications)

## Graduation Requirements

### Foundations

Select at least one from the following:		3
C S 510	Automata, Languages, Computability	
C S 570	Analysis of Algorithms	
C S 571	Programming Language Structure II	
C S 572	Advanced Algorithms	
C S 586	Algorithms in Systems Biology	

### Systems

Select at least one from the following:		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 584	Computer Networks II	

### Applications

Select at least one from the following:		3
C S 515	User Interface Design	
C S 516	Bioinformatics	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	

Other		
Other graduate credit to meet NMSU requirements		21
C S 700	Doctoral Dissertation	18
Total Credits		48

Only courses from the MS CS program from NMSU can be used to waive this requirement.

Students should contact the department for information on additional graduation requirements, or visit the on-line Graduate Handbook (<http://www.cs.nmsu.edu/>).

## Computer Science - Graduate Minor

Students who wish to take a minor in Computer Science will need to accumulate a minimum of 9 graduate credits in Computer Science courses. Students are encouraged to contact the Computer Science Graduate Committee Chair for directions in the selection of courses.

## Creative Media

### Undergraduate Program Information

New Mexico State University's Creative Media Institute (CMI) prepares students to become digital storytellers using state of the art, industry-standard tools. The Creative Media Institute is dedicated to developing and nurturing the artistic endeavors of student filmmakers through industry-standard education, research and collaboration in the art, craft and production of the moving image through storytelling, resulting in a Bachelor of Creative Media degree. The program provides learning opportunities for newly admitted NMSU students, and provides some credit transfer opportunities for students with an associate degree from a NMSU community college or other two-year degree granting institution. The Bachelor of Creative Media provides a liberal arts background enabling students to pursue further education, professional training or employment in the digital media-based industry. Study in the CMI program fosters collaborative expression based on a clear understanding of media culture, history, design and practice. CMI also offers students the opportunity for internships in digital video, animation, visualization and simulation, industrial and educational video at varied production facilities on and off campus.

Theory and practice are integrated at every step as students manipulate text, sound and images using industry-standard technology. CMI houses a state of the art digital projection system screening room, post-production lab, animation lab, production space, motion capture laboratory and THX sound mixing theatre.

Due to limited capacity, new students wishing to continue in the CMI program after their freshman year are required to complete an application process. Transfer students from other institutions, including NMSU Community Colleges, must complete the application process. Transfer students should contact an Academic Advisor from the College of Arts and Sciences Advising Office for information about joining one of the two degree programs offered in CMI. Space is limited and varies each year. The quality of the student's work as demonstrated in the application and prior course work are additional criteria of the admission decision. Exact details and procedures for applying to the CMI program can be found on the CMI website at: [cmi.nmsu.edu](http://cmi.nmsu.edu) (<http://cmi.nmsu.edu>).

## Degrees for the Department

Animation and Visual Effects - Bachelor of Creative Media (p. 269)

Digital Film Making - Bachelor of Creative Media (p. 270)

## Minors for the Department

Animation and Visual Effects - Undergraduate Minor (p. 271)

Digital Film Making - Undergraduate Minor (p. 271)

**Associate Professor, Amy Lanasa, Department Head**

**Associate Professors** Fisher, Lanasa; **Assistant Professors** Fowler, Lapid, Lau; **College Assistant Professors** Bakshi, Chase, Gorell, Marks; **College Instructor** Nirmalakhandan

## Creative Media Courses

### CMI 100. Introduction to the Creative Media Industry

#### 3 Credits

This class is an introductory course for students interested in learning about the creative media industry and the Creative Media Institute. It offers a broad view of the entire industry including Marketing, Production, Budgets, Jobs, New Media Literacy, and Industry Standards. Students will listen to experts in the field, and become involved in open discussions about the industry and use new information to complete hands-on assignments in the laboratory. Restricted to Las Cruces campus only.

### CMI 200. Sound Design 1

#### 3 Credits

Focuses on the techniques for creating, recording and manipulating sounds through challenging sound design projects. Crosslisted with: CMT 206.

**Prerequisite(s)/Corequisite(s):** CMI 235. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

### CMI 205. Cinematography I

#### 3 Credits

Theories and techniques of visual design in videography and the aesthetics of lighting. Crosslisted with: CMT 205.

**Prerequisite(s)/Corequisite(s):** CMI 235. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

### CMI 216. Editing I

#### 3 Credits

Focuses on individual editing skills including capture, interface, basic cuts, and transitions. Crosslisted with: CMT 195.

**Prerequisite(s)/Corequisite(s):** CMI 235. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

### CMI 220. Drawing for Animation

#### 3 Credits

Introductory study of the human and animal form in relation to animation. Students learn fundamentals and exaggeration of the figure, as related to proportion, rhythm, mechanics, and motion. Areas of focus are: basic form, proportion, shape, contour, gesture, anatomy, portraiture, perspective, clothing effects and drawing from observation. Restricted to: CMT,DFM,ANVE majors.

**CMI 228. History of Cinema I****3 Credits**

This course surveys the history of cinema - investigating the process by which the original "cinema of attractions" evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, as well as many key international movements that helped shape it. Restricted to: G-CMI, DFM, ANVE majors.

**CMI 231. History of Animation****3 Credits**

Explores the history of Animation as an art form and industry through readings, screenings, lecture and periodic guest speakers. Restricted to: G-CMI, ANVE, DFM majors. Restricted to Las Cruces campus only.

**CMI 232. Storyboarding****3 Credits**

Examines effective writing principles for creating storyboards that communicate the overall picture of a project. There are timing, scene complexity, emotion and resource requirements. Crosslisted with: ENGL 232. Restricted to: DFM,ANVE, G-CMI majors. Restricted to Las Cruces campus only.

**CMI 233. Light, Shade, Render****3 Credits**

This course will explore the theory and practice of 3D lighting and rendering methodologies. Techniques covered will implement cameras, lighting sources, textures, surface-mapping and algorithmic rendering to produce stylized and photo realistic images. Topics covered will include direct and indirect lighting, shaders that simulate physical substances and effects, rendering multiple passes and simulating physical lens effects. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** CMI 260, CMI 280, or Consent of Instructor.

**CMI 235. Narrative: Principles of Story Across the Media****3 Credits**

Examines the various strategies of written and visual storytelling: narrative structure and its principle components (plot, theme, character, imagery, symbolism, point of view), with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc. Crosslisted with: ENGL 235. Restricted to: G-CMI, DFM, ANVE majors. Restricted to Las Cruces campus only.

**CMI 240. Digital Illustration****3 Credits**

Introductory course examining traditional artistic expressions and translating visual art experiences into a digital art medium to enhance visual storytelling. Students acquire basic principles of drawing and painting through hands-on experience manipulating tonal value, composition, form development, light and shadow, color theory, rendering realism, and graphic design. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 245. 2-D Compositing & FX****3 Credits**

The purpose of this course is to familiarize students with the powerful compositing and special effects tools of Adobe After Effects for 2D, traditional animation. Students will learn how to assemble an existing un-rendered animation into a final piece with advanced 3D lighting, spacing, and digital effects so that it can achieve a dynamic, professionally rendered look. Restricted to Las Cruces campus only.

**CMI 250. Beginning 2-D Animation****3 Credits**

Learn the basics of digital 2D animation by creating an animated short from a storyboarded scene using professional animation, imaging, and editing software. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 260. Foundations of 3D Animation****3 Credits**

The objective of this course is to provide a hands-on overview of the 3D animation production process. Students will be introduced to basic story development and the creation of computer generated assets and cinematic sequences. The course will survey specialty areas of digital animation and various software and techniques applied in entertainment and information media. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** CMI 235, CMI 232 or consent of instructor.

**CMI 270. Rigging for 3D Animation****3 Credits**

This course will introduce principles and practices of current 3D animation rigging. Students will develop fundamental methods necessary to create character rigs. Students will learn aesthetic, technical, and optimization concepts as they apply to organic and mechanical designs. Topics will include: hierarchies, constraints, deformation rigging, skeleton creation, skinning, forward and inverse kinematics, controls, body and facial rigging. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** CMI 260.

**CMI 280. Modeling****3 Credits**

This course will introduce 3D modeling methods and current practices. Students will learn preliminary and detailed modeling techniques using industry standard software. Methods will emphasize formal and functional aspects of modeling as they apply to mechanical, organic, and sculpted topology for application in animation, games, and information media. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 290. 3-D Animation****3 Credits**

Overview of the essentials and principles of 3D animation; creative methods for using industry standard tools to produce the illusion of movement for storytelling. Topics include, keyframe and curve animation, kinematics, cycle animation, camera animation, deformers, and constraints.

**Prerequisite(s):** CMI 260, CMI 250 or consent of instructor.

**CMI 300. History of Cinema II****3 Credits**

An advanced, in-depth analysis of cinema's history. Course may focus on one specific area of cinema history depending on instructor.

**Prerequisite(s)/Corequisite(s):** CMI 235, CMI 228. Restricted to: DFM, ANVE, G-CMI majors. Restricted to Las Cruces campus only.

**CMI 301. Sound Design II****3 Credits**

Mixing and balancing dialogue, sound effects and music in postproduction. Study the role of sound effects, foley, soundtrack choices, and music supervision. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 200.

**CMI 303. Cinema Review and Critique****3 Credits**

This course is for the student who wants to learn to be a more active, intelligent film viewer. It encourages critical thinking about films and educates students on how to write a film review. Students will meet in the movie theater to watch essential films that serious movie watchers should see from classic motion pictures, to current release major motion pictures, independent films and world cinema features. The course will serve as a guide to the illuminating process of evaluating, analyzing, and reviewing movies. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 235.

**CMI 305. Business of Filmmaking/Animation****3 Credits**

Explores the roles of unions, basic contracts, legal arrangements, and the economics of the production process, distribution, and financing. Consent of Instructor required.

**Prerequisite(s):** CMI 235.

**CMI 308. Writing for Animation****3 Credits**

This class explores methods for, and approaches to, writing for animation. Students study and produce scripts for a range of animation outlets while engaging in writing exercises based on character and story development.

**Prerequisite(s):** CMI 235 or consent of instructor.

**CMI 309. Screenwriting I****3 Credits**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Crosslisted with: ENGL 309 and THTR 306.

**Prerequisite(s):** ENGL/CMI 235 or consent of instructor.

**CMI 310. Cinematography II****3 Credits**

Advanced tools of the cinematographer, lighting and composition techniques. Artistic and technological elements of cinematography. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 205, CMT 205.

**CMI 311. Editing II****3 Credits**

Advanced techniques in digital films using professional non-linear editing systems. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 216.

**CMI 314. Acting for Film****3 Credits**

Techniques for film and television acting. In-depth analysis of film performance creation among actor, director, writer, cinematographer, and editor. Restricted to: THTR, DFM majors.

**Prerequisite(s):** CMI 235.

**CMI 315. Adventures in Genre****3 Credits**

Students learn storytelling strategies for the screen by studying various structural genres and components of screenplays and films. Utilizing these strategies, students develop a number of their own original screenplay ideas. Additionally, pitch workshops are held and students learn to present their ideas in various, practical situations.

**Prerequisite(s):** CMI 235 and CMI 309.

**CMI 316. Border Cinema Around the World****3 Credits**

What is the relationship between borders, identity, and vulnerability - and how is this relationship explored in cinema? How are borderlands also testing grounds - the sites of serious ethical dilemmas? By examining powerful feature films from such regions as the Middle East, the Balkans, and the US/Mexico border, we will explore ways in which personal, familial, communal, and national identities are defined through the complex process of bordering. We will investigate the role of cinema in reflecting and/or facilitating this process.

**CMI 318. Documentary Production****3 Credits**

Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 216, CMI 205.

**CMI 320. Race and Gender in Film****3 Credits**

In this course students will analyze film as an art form as well as be exposed to Race and Gender Feminist Film Theory. We will consider the role of film in our understandings of sex, gender and sexuality. Through discussions and writing we will work to discern relevant social, political, ideological, and aesthetic concepts in the media we examine. Crosslisted with: ENGL 399, W S 450 and W S 550.

**CMI 321. Las Cruces International Film Festival Production****3 Credits**

This course is designed to enhance student knowledge about film festivals and the Las Cruces International Film Festival. From soup to nuts, students will learn how to manage and execute a major film festival, including film solicitation and submissions, festival event marketing, celebrity appearances, industry workshops, filmmaker coordination and brand management. Students will gain an appreciation of the value of a film festival to the community and for visiting filmmakers. Students will apply this knowledge in their written assignments, film evaluations, and departmental responsibilities. Each student will help program a festival category and co-manage one of the critical elements of the festival. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 235.

**CMI 328. Producing****3 Credits**

Examines the role of the Producer, essential to every film production. The course will revolve around the best practices in organizational design, the production process, the budgeting process, financial controls, scheduling, insurance and distribution.

**Prerequisite(s)/Corequisite(s):** CMI 200, 216, 235. Restricted to: ANVE, DFM majors.

**CMI 329. Studies in Drama****3 Credits**

Students will draw on a group of related American and European dramatic works to examine various areas of 20th century culture. Topics will vary. Restricted to DFM, ANVE, ENGL, THTR majors. Crosslisted with: ENGL 329 and THTR 329

**CMI 330. Developing the Animated Project****3 Credits**

This course will cover fundamental theories and elements of the production and development processes for animated projects. Concept, story, and story and character development will be addressed as well as storyboarding, layout, sound, voice recording and basic editing. Students will develop at least one animated project, and construct an animatic to be used for future production. Restricted to: ANVE, DFM majors.

**CMI 332. 3-D Character Animation****3 Credits**

Essentials and principles of 3D character animation. Techniques and craft of breathing life into characters through movement, including dynamic poses, blocking action, run and walk cycles, lip syncing and realism. THTR 110, Acting and CMI 200, Sound Design are recommended. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** THTR 105 (or CMI 314 or CMI 348), CMI 260 and CMI 290 or consent of instructor.

**CMI 341. Visual Effects I****3 Credits**

Fundamentals and principles of live action footage and computer generated imagery integration, including 3D animation, matchmoving, green screen setup, keying and compositing. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 205, CMI 260, 280 (or consent of instructor).

**CMI 348. Acting for Animation****3 Credits**

This course explores performance techniques relevant to animators including 2D and 3D animation and motion capture. Students learn to create dynamic, dramatic performances and believable character interactions. Students learn to analyze scripts, sound, acting, action and performance for production. Topics include: acting theory, emotional/mental states, character movement and style, dynamic facial expression, scene construction, posing, layering and rhythm, simplification and exaggeration, and voice-over. May be repeated up to 3 credits. Restricted to: DFM,ANVE majors.

**CMI 350. Intermediate 2-D Animation****3 Credits**

Learn the more refined aspects of motion for character animation by focusing on Disney's 12 Principles of Animation, practicing these advanced drawing techniques in exercises and incorporating them into a brief final short.

**Prerequisite(s):** CMI 250.

**CMI 360. Previsualization****3 Credits**

Implements 3D animation tools in preproduction shot and sequence design for motion picture and broadcast industries; including 3D storyboarding, technical planning and editing basics. LC Campus Only.

**Prerequisite(s):** CMI 260, CMI 280, and CMI 290 or consent of instructor. Restricted to ANVE, DFM majors.

**CMI 362. Motion Graphics****3 Credits**

Students will learn the basics of Motion Graphics by working through a variety of exercises and a final project that will combine animation, text, visual effects, and sound using Adobe After Effects, Photoshop, and Illustrator. Restricted to: ANVE, DFM majors.

**CMI 365. Character Design and Development****3 Credits**

Digital character design for the entertainment industry. Provides insight into the process of creating iconic characters. Traditional and contemporary character designers are explored. Industry workflow is introduced and necessary skills are developed to design detailed 3D characters from concept through production.

**Prerequisite(s):** CMI 250, CMI 260 and CMI 280, or consent of instructor. Restricted to ANVE, DFM majors.

**CMI 377. Game Design Workshop****3 Credits**

In this course we will learn to design, develop, and playtest games. This approach will be exercise driven and involve nontechnical approaches as well as digital production techniques. This playcentric approach will involve player participation from conception through production. We will explore the iterative processes of prototyping, playtesting, and revising based based on feedback. Consent of Instructor required. Restricted to: ANVE, DFM majors.

**CMI 395. Directing I****3 Credits**

Study and application through short scene work of the basic tools of a director and relationships with actors, designers, playwright, and stage managers. Interpreting as well as organizing. May be repeated up to 3 credits. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** CMI 200, AND CMI 205, AND CMI 216.

**CMI 396. Directing II****3 Credits**

Addresses pre-production concerns including script breakdown, casting ground plans and coverage. The criteria employed when selecting the creative team including a director of photography, art director, light, sound and wardrobe designers. Introduction to budgeting, scheduling, and script breakdowns. Prerequisite: CMI 395

**CMI 397. Practicum****1-3 Credits (1-3)**

Practical application of the student's field of study in a project environment. May be repeated up to 9 credits. Consent of Instructor required.

**CMI 398. Special Topics****3 Credits**

This course addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. May be repeated up to 12 credits.

**CMI 400. Directed Studies****1-6 Credits (1-6)**

Directed study course in CMI under the supervision of a CMI faculty member. May be repeated up to 9 credits.

**CMI 401. Motion Capture Techniques****3 Credits**

Implement industry standard motion capture techniques to capture and integrate performance for movie making, 3D animation and game production. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 260, CMI 290 and CMI 270 (or consent of instructor).

**CMI 410. Cinematography III****3 Credits**

This class is geared towards those who want to learn more about cinematography, color grading, and digital technology as it pertains to cinematography. Shooting high-end codecs (ProRes/DNxHD) or RAW are becoming more and more popular in filmmaking as camera manufactures and computer processing get better. This class will be a mix of production and post-production as learning how to shoot these higher end codecs do not end with the camera. Focus will be on techniques of shooting raw, understanding how to operate a camera capable of high end image acquisition, properly building up the camera rig and accessories, managing data and the post-production workflow. Consent of Instructor required. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 310.

**CMI 412. Advanced Equipment Training****3 Credits**

This class is designed for students who want to dive deep into building and operating much of our advanced camera and G&E equipment. Though these on-set tasks are performed by below-the-line crew members, having the knowledge of and ability to use this equipment will serve you greatly as a DP. We will go over a wide variety of devices in this class, ranging from car mounts and our GlideCam to our large jib, 3-axis gimbal, 500-amp generator, and 6K HMI lights. We will also do some advanced lighting scenarios. The goal of this class is to get you "certified" on all the above items, resulting in your being able to build this equipment for other CMI sets, such as the Mixed Class Productions, Senior Projects, etc. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 310.

**CMI 420. Short Film Production****3 Credits**

Students work in teams with rotating crews to write, produce, direct and edit individual and group projects-ultimately demonstrating growing confidence with production equipment and professional practices. May be taken up to 6 credits. Consent of instructor required. Pre/

**Prerequisite(s):** CMI 200, CMI 216, CMI 205, CMI 235, CMI 309 and CMI 395.

**Corequisite(s):** CMI 328. Restricted to ANVE, DFM majors.

**CMI 421. Short Film Post-Production****3 Credits**

Students work together to complete short films shot in CMI 420. This course focuses on advanced post-production techniques, including editing and sound design, as student directors, editors and producers continue to learn to work together. In the last half of the course, students will build marketing campaigns and submit their finished film to festivals. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 420.

**CMI 433. Sets and Environments****3 Credits**

Digital environment design and creation for movies and games from concept to production; including illustration, modeling, matte painting, texturing, lighting, rendering, integration, and camera projection. May be repeated up to 3 credits. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 260, CMI 280, and CMI 233 or consent of instructor.

**CMI 450. Advanced 2-D Animation****3 Credits**

Advanced techniques in two dimensional animation including motion graphics and integration of live action. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 350.

**CMI 470. Short 2-D Animation Production****3 Credits**

This is a full-scale animation production class where students will be divided into teams according to the animation skills they have demonstrated in the beginning, intermediate, and advanced classes. Each team member will specialize in one important facet of the production process: character animation, background painting, technical direction, coloring, or story development and storyboarding. 4 to 8 minute animated shorts will be produced. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 450, CMI 361.

**CMI 477. Digital Game Design****3 Credits**

This course covers the theory and practice of digital game production using industry standard media and game engine applications. Students apply animation and game development approaches toward game engine constraints and requirements to create gameplay experiences. Design and production methods are implemented to create game levels and populate them with original assets. Team based game prototyping will require multiple disciplines to devise unique digital game experiences. Consent of Instructor required. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 377.

**CMI 480. Screenwriting II****3 Credits**

Students will write 2 short scripts, 10-15 pages each throughout the semester. Focus will be on learning how to take notes and rewrite. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Crosslisted with: ENGL 480

**Prerequisite(s):** ENGL 309 or CMI 309 or THTR 306 or consent of instructor. Restricted to ENGL, DFM, ANVE majors.

**CMI 490. Advanced Screenwriting****3 Credits**

Students will prepare a 30-60 page screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. This course is aimed at preparing writers for the professional market. Consent of instructor required. Restricted to ENGL, DFM, ANVE majors. Crosslisted with: ENGL 491

**CMI 491. 3D Production Studio I****6 Credits**

The course is the first semester of a year-long effort to complete a Senior Project. The project will be narrative-driven short form, 3D animation or visual effects movie. Emphasis will be on pre-production and some production depending on ongoing CMI productions. You will produce a professional quality product with the aim to assist you in gaining entry into professional employment or graduate school. The course may be adapted toward a specific concentration in animation, visual effects, or digital film making, for group and individual productions. Each project must be approved by the Instructor and work within departmental policies and procedures.

**Prerequisite(s)/Corequisite(s):** CMI 332, CMI 360, CMI 365, CMI 433.

**Prerequisite(s):** CMI 308. Restricted to: ANVE majors.

**CMI 492. 2D Production Studio I****6 Credits**

In CMI 498, Pre-Production, students will write a script, create a storyboard, record voice over and/or dialogue and time these storyboards to this dialogue/voice over creating an Animatic. For those doing demo reels, students will start to compile exercises from all of all their prior classes. Additional exercises will then be assigned to augment the skill set of the student according to the needs of each student. Restricted to: ANVE majors.

**Prerequisite(s):** CMI 350, CMI 361.

**CMI 493. 3D Production Studio II****6 Credits**

The course is the final semester of a year-long concentration on your Senior Project. Emphasis will be on the production, post-production, and distribution of the work created in the first semester. You will produce a professional quality product that will help you gain entry into professional employment or graduate school. The overall objective is that you will demonstrate mastery of craft through synthesis of concept and technique, resulting in an original cinematic experience. Restricted to: ANVE majors.

**Prerequisite(s):** CMI 491.

**CMI 494. 2D Production Studio II****6 Credits**

Students will complete an entire animated short, trailer, or demo reel for their portfolios by the end of Senior Project II. In CMI 494, Production and Post-Production, students will animate their stories according to the layout set in the animatic from Senior Project I. Lastly, they will composite and edit their shorts into a final piece that will be viewable in time for the Senior Showcase. For demo reels, students will continue to hone their reel into a finished piece that can be presented at the Senior showcase. Restricted to: ANVE majors.

**Prerequisite(s):** CMI 492.

**CMI 495. Internship****1-12 Credits (1-12)**

Placement in a production facility and supervised experience required. With CMI advisor approval only. May be repeated up to 18 credits. Consent of Instructor required. Restricted to: DFM,ANVE majors.

**CMI 496. Media Law/Ethics****3 Credits**

Overview of legal & ethical issues in creative media elements of business and commercial law. This class will focus on the fundamentals of entertainment law by exploring the business and legal relationships within film industries, and animation. Learn to anticipate and avoid legal problems prior to production. Key issues in the area of copyright law, sources of financing, distribution agreements; insurance and union consideration will be discussed. Restricted to ANVE, DFM majors.

**CMI 497. Portfolio Design and Development****3 Credits**

Advanced graphic design projects with an emphasis on conceptual development, portfolio preparation, and professional practices. Refine general marketing strategies, personal portfolio, and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional/demo packages. Restricted to: DFM,ANVE majors.

**CMI 498. Final Year Senior Project I: Production and Post Production 3-6 Credits (3-6)**

Senior Project I is the first half of a year long concentration on a pre-approved creative project guided by a faculty member. Projects are narrative-driven and have an end product: screen-play, short film, documentary, 2-D or 3-D animated short, or pilot with treatment for television. Consent of Instructor required. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** Consent of instructor.

**CMI 499. Final Year Senior Project II: Production and Post Production 3-6 Credits (3-6)**

Senior Project II is the second half of a year long concentration on a pre-approved project, guided by a faculty member. Projects are narrative driven and have an end product: short film, documentary, 2-D or 3-D animated short, or pilot and treatment for television. May be repeated up to 9 credits. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 498 and Consent of Instructor.

**Name:** Amy Lanasa

**Office Location:** Milton Hall, Room 172-A

**Phone:** (575) 646-6142

**Website:** <http://cmi.nmsu.edu/>

## Animation and Visual Effects - Bachelor of Creative Media

Students must complete all university requirements and the Animation and Visual Effects curriculum outlined below. All Animation and Visual Effects Curriculum requirements must be completed with a grade of C- or higher.

### Requirements

<b>General Education Requirements</b>		<b>35</b>
<b>Viewing a Wider World</b>		<b>6</b>
<b>Departmental Requirements</b>		
CMI 231	History of Animation <sup>1</sup>	3
CMI 235	Narrative: Principles of Story Across the Media <small>(Required Pre-Application class for ANVE)</small>	3
or ENGL 235	Narrative: Principles of Story Across the Media	
THTR 105	Acting for Non-Majors	3
CMI 232	Storyboarding	3
or ENGL 232	Script Development and Storyboarding	
CMI 233	Light, Shade, Render	3
or CMI 245	2-D Compositing & FX	
CMI 240	Digital Illustration	3
CMI 250	Beginning 2-D Animation	3
CMI 260	Foundations of 3D Animation	3
CMI 270	Rigging for 3D Animation	3
or CMI 220	Drawing for Animation	
CMI 280	Modeling	3
CMI 290	3-D Animation	3
or CMI 350	Intermediate 2-D Animation	
CMI 308	Writing for Animation	3
or CMI 309	Screenwriting I	
CMI 341	Visual Effects I	3

or CMI 303	Cinema Review and Critique	
CMI 401	Motion Capture Techniques	3
or CMI 348	Acting for Animation	
CMI 360	Previsualization	3
or CMI 362	Motion Graphics	
CMI 332	3-D Character Animation	3
or CMI 450	Advanced 2-D Animation	
CMI 365	Character Design and Development	3
or CMI 433	Sets and Environments	
CMI 491	3D Production Studio I	6
or CMI 492	2D Production Studio I	
CMI 493	3D Production Studio II	6
or CMI 494	2D Production Studio II	
<b>Electives (to bring total to 120)</b>		16
<b>Second Language Requirement: (not required)</b>		0
Total Credits		120

<sup>1</sup> Required Pre-Application class for ANVE

## Second Language Requirement

For the Bachelor of Creative Media with a major in Animation and Visual Effects, there is no second language requirement for the degree.

# Digital Film Making - Bachelor of Creative Media

Students must complete all university requirements and the Digital Film Making curriculum outlined below. All Digital Film Making Curriculum requirements must be completed with a grade of C- or higher.

## Requirements

<b>General Education Courses</b> <sup>1</sup>		35
<b>Viewing a Wider World Courses</b> <sup>1</sup>		6
<b>Foundation Courses</b>		
CMI 100	Introduction to the Creative Media Industry <sup>2</sup>	3
CMI 200	Sound Design I	3
or CMT 206	Principles of Sound	
CMI 205	Cinematography I	3
or CMT 205	Cinematography	
CMI 216	Editing I <sup>3</sup>	3
or CMT 195	Digital Video Editing I	
CMI 235	Narrative: Principles of Story Across the Media (Required pre-application course for DFM)	3
or ENGL 235	Narrative: Principles of Story Across the Media	
CMI 228	History of Cinema I	3
CMI 303	Cinema Review and Critique	3
or ENGL 303	Theory and Criticism: Film, Media and Culture	
or ENGL 326	Cultural Identity and Representation Across the Media	
CMI 314	Acting for Film	3
or THTR 311	Acting for Film and Television	
CMI 328	Producing	3
or CMI 305	Business of Filmmaking/Animation	

CMI 497	Portfolio Design and Development	3
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### CMI Elective Courses

Select 27 credits from the following (21 credits must be 300 level and above):<sup>4</sup> 27

CMI 231	History of Animation
CMI 232	Storyboarding
CMI 250	Beginning 2-D Animation
CMI 260	Foundations of 3D Animation
CMI 300	History of Cinema II
CMI 301	Sound Design II
CMI 305	Business of Filmmaking/Animation
CMI 308	Writing for Animation
CMI 309	Screenwriting I
CMI 310	Cinematography II
CMI 311	Editing II
CMI 315	Adventures in Genre
CMI 316	Border Cinema Around the World
CMI 318	Documentary Production
CMI 320	Race and Gender in Film
CMI 329	Studies in Drama
CMI 341	Visual Effects I
CMI 395	Directing I
CMI 396	Directing II
CMI 397	Practicum
CMI 398	Special Topics
CMI 400	Directed Studies
CMI 410	Cinematography III
CMI 420	Short Film Production
CMI 421	Short Film Post-Production
CMI 480	Screenwriting II
CMI 490	Advanced Screenwriting
CMI 495	Internship
CMI 496	Media Law/Ethics
CMT 126	Film Crew Training I <sup>4</sup>
CMT 156	Film Crew Training II <sup>4</sup>
CMT 190	Digital Video Production I <sup>4</sup>
CMT 210	Digital Video Production II <sup>4</sup>
CMT 215	Digital Video Editing II <sup>4</sup>
CMT 222	Pre-production Management <sup>4</sup>
ENGL 232	Script Development and Storyboarding
ENGL 309	Screenwriting I
ENGL 336	Studies in Film
THTR 306	Screenwriting I

**Electives: to bring the total to 120 credits** 22

**Second Language Requirement: (not required)**

Total Credits	120
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<sup>1</sup> For more information please see the General Education (p. 46) and Viewing a Wider World (p. 48) section of the catalog.

<sup>2</sup> Required pre-application course for DFM

<sup>3</sup> Course may be taken at an NMSU community college.

<sup>4</sup> See course descriptions in the designated community college campuses.

## Second Language Requirement

For the Bachelor of Creative Media with a major in Digital Film Making there is no second language requirement for the degree.

## Animation and Visual Effects - Undergraduate Minor

**Must be admitted to DFM**

Take 18 credits of CMI/ENGL, CMI/THTR courses as listed in the Animation and Visual Effects major. A minimum of 9 credits must be upper division.

## Digital Film Making - Undergraduate Minor

**Must be admitted to ANVE**

Take 18 credits from the CMI/ENGL, CMI/THTR courses as listed in the Digital Film Making major. A minimum of 9 credits must be upper division.

## Criminal Justice

### Undergraduate Program Information

The Department of Criminal Justice offers courses in the traditional setting as well as online. However, we do not offer a fully online Bachelor of Criminal Justice (BCJ). We offer an online Degree Completion Program. Students interested in completing the degree online need to complete at least the first two years on campus while working closely with an academic advisor.

The criminal justice degree plan is broadly interdisciplinary in nature embracing the study of the humanities, law, natural, behavioral and social sciences. The curriculum seeks to balance theoretical inquiry with applied knowledge.

Students become prepared for careers in law enforcement, corrections, probation and parole, work with juveniles, victim services, non- and not-for profit organizations connected with criminal and social justice, and the related field of forensics. Graduates have also been successful in law school and graduate programs in the social sciences. The undergraduate major consists of at least 33 credits in the major field, 27 of which must be numbered 300 or above (excluding C J 393 Internship in Criminal Justice).

The department offers an interdisciplinary minor in Forensic Sciences and has partnered with various other departments to offer an interdisciplinary minor in child advocacy studies. Students interested in the minor should consult with the department head.

### Graduate Program Information

The Department of Criminal Justice offers graduate study leading to the Master of Criminal Justice (MCJ) degree. Admission to the MCJ is competitive and prospective graduate students are expected to have at least a 3.0 undergraduate grade-point-average, coursework in research methods and statistics, and possess a bachelor's degree. Those

not meeting these requirements may be admitted conditionally and required to make up deficiencies at the outset of their program of study. Applicants must submit three letters of recommendation and a 3-5 page essay introducing themselves and addressing the following topic: "What is the most important change needed in the criminal justice system?" This essay serves as a sample of written work to be evaluated by the MCJ Graduate Committee. The GRE is NOT required for admission into the MCJ program. The MCJ Graduate Committee may require a student to complete additional English writing coursework. For more information, please visit our website: <http://crimjust.nmsu.edu/criminal-justice-graduat/>.

Students must declare their intent to pursue one of the two degree options: the thesis option or the focused coursework option. The degree options are provided so that students may better match their education with career goals. The thesis option is often used by students interested in pursuing careers in basic and applied criminal justice research or a doctoral degree. The focused coursework option is often used by students pursuing administrative positions within criminal justice agencies. The thesis option is only available for Campus-Based students. Online students may only pursue the Focused Coursework Option.

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please contact the director of the MCJ program or consult the Department of Criminal Justice web site <http://crimjust.nmsu.edu/criminal-justice-graduat/> for details.

Thesis students must submit a thesis proposal to their faculty committee at a proposal hearing for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination includes a defense of the completed thesis, but may also include a general examination based upon the candidate's program of study. The minimum coursework requirements are displayed below.

Focused coursework students must pass two written comprehensive examinations following completion of the required courses, no earlier than their third semester. Students not passing the examinations will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

### Online M.C.J. Coursework

There is an online option for the MCJ degree. Online criminal justice courses are available only to those admitted to the MCJ program as online students, or with permission of the Director of the MCJ program. Students desiring to be admitted to the MCJ program as online students must declare that intent in writing to the MCJ director. Online students may not enroll in campus-based criminal justice courses. Online students may only pursue the Focused Coursework Option, not the Thesis Option. For more information regarding the online MCJ degree option, consult the Department of Criminal Justice web page, <http://crimjust.nmsu.edu>, or contact the Director of the MCJ program.

### Teaching Assistantships

Teaching assistantships are typically available for some traditional (on-campus) MCJ students on a competitive basis. The Director of the MCJ Program will contact admitted students to determine their interest, and

the Graduate Committee will make recommendations to the Department Head for a final decision.

## Degrees for the Department

Criminal Justice - Bachelor of Criminal Justice (p. 276)

Law and Society - Undergraduate Supplemental Major (p. 279)

Criminal Justice - Master of Criminal Justice (p. 279)

## Minors for the Department

Child Advocacy Studies - Undergraduate Minor (p. 277)

Forensic Science - Undergraduate Minor (p. 278)

### Professor, Dennis M. Giever, Department Head

**Associate Professors** Keys, Lara, Posadas; **Assistant Professors** Alatorre, Natividad, Tapia, Valadez; **College Associate Professors** Corbett, Dimitrijevic, Joseph; **Emeritus Professors** Crowley, Gregware, Mays (Regents), Winfree

*F. Alatorre\*, Ph.D. (Arizona State)– immigration, race, ethnicity, gender in criminal justice; D. Keys, Ph.D. (Missouri-Columbia)– penology, narcotic policy; D. Lara, Ph.D. (University of California-Berkeley)– cultural studies, race & ethnicity, border justice; N. Natividad, Ph.D. (Arizona State)–borderland studies, race and identity studies, immigration; C. Posadas, Ph.D. (Arizona State)– immigration and justice, juvenile justice, research methods; M. Tapia, Ph.D. (Ohio State)–crime theory, race and crime, juvenile justice; M. Valadez (Arizona State)–courts and sentencing, immigration.*

\*MCJ Program Director

## Criminal Justice Courses

### C J 101G. Introduction to Criminal Justice

#### 3 Credits

Examination of crime and justice within the broader social and cultural context of U.S. society from interdisciplinary social science perspectives. Includes critical analysis of criminal justice processes and the ethical, legal, and political factors affecting the exercise of discretion by criminal justice professionals.

### C J 199. Special Topics in Criminal Justice I

#### 1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated under different topics for a maximum of 6 credits.

### C J 205. Criminal Law

#### 3 Credits

Rules, principles, and doctrines of criminal liability in the United States. The historical development, limits, and functions of the substantive criminal law. May be repeated up to 3 credits.

### C J 210. The American Law Enforcement System

#### 3 Credits

Historical and philosophical foundations of law and order. An in-depth examination of the various local, state, and federal law enforcement agencies.

### C J 221. Fundamentals of Criminal Investigation

#### 3 Credits

Investigation procedures from crime scene searches, collection of evidence, and case preparation. Community Colleges only. (Note: students completing C J 221 may not take C J 321.)

### C J 230. Introduction to Corrections

#### 3 Credits

Development of correctional philosophy, theory, and practice.

Instructional and non-institutional alternatives available in the corrections process.

### C J 250. Courts and the Criminal Justice System

#### 3 Credits

Structures and functions of American courts. Roles of attorneys, judges, and other court personnel; operation of petit and grand juries, trial and appellate courts.

### C J 293. Field Experience in Criminal Justice

#### 3-6 Credits

Field experience in a public criminal justice agency or equivalent private sector organization. Supervised internship experience, conferences, and observations. Restricted to majors. Community Colleges only.

**Prerequisites:** C J 101G, prior arrangement and consent of instructor and a GPA of 2.0 or better in major.

### C J 300. Introduction to Criminal Justice Research

#### 3 Credits

Overview and evaluation of criminal justice research. Selection of research topics, methods of data selection and collection, analysis techniques, and presentation of findings.

**Prerequisite:** restricted to majors or consent of instructor.

### C J 301. Advanced Research Methods

#### 3 Credits

Study of selected quantitative and qualitative skills and their application to criminal justice research.

**Prerequisite:** Restricted to majors or consent of instructor.

### C J 302. Crime, Justice and Society

#### 3 Credits

Through critical analysis students build a rich understanding of the role of crime in our contemporary landscape and explore ideas and practices associated with justice, victimization, criminality, morality and righteousness. The course cultivates knowledge & awareness of the interactions between socially constructed phenomena (race, class, power, ethnicity, economic structures) and popular beliefs, policies, and practices associated with crime, punishment, and formal social control. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 111G, 203G, 211G, 218G, & 311G.

Restricted to: Criminal Justice majors.

### C J 303. Introduction to Criminological Theory

#### 3 Credits

Defining and measuring crime, crime causation, and the criminal behavior system, and their linkage to criminal justice policies, procedures, and practices. Completed two of the following: ENGL 111G, 203G, 211G, 218G, or 311G. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors or consent of the instructor and must have completed C J 300.

**Corequisite(s):** Must be enrolled or have completed third English writing class.

**C J 304. Historical Perspectives of Criminal Justice Systems****3 Credits**

Examines the precursors to and development of three distinct systems associated with crime and punishment in the United States: the Courts, the Police, & Corrections. By studying the historical context and socio-political backdrop in which these institutions emerged and expanded students will come to a richer understanding of them and their attendant polices, practices, conventions, and assumptions. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 111G, 203G, 211G, 218G, & 311G. Restricted to: Criminal Justice majors.

**Prerequisite(s):** C J 300.

**C J 306. Criminal Procedural Law****3 Credits**

Legal analyses of the rights of criminal defendants; legal duties and responsibilities of criminal justice personnel in the processing of criminal defendants. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 307. Law of Evidence****3 Credits**

Evidentiary rules and concepts and their application in a criminal trial. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 321. Criminal Investigation and Intelligence****3 Credits**

Principles of criminal investigation and intelligence production; processing cases from complaint through crime scene search, identification and collection of evidence, interviewing and interrogation, and case preparation for courts. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 331. American Correctional Institutions****3 Credits**

Structure, organization, and operations of United States jails and prisons. Overview of correctional standards and classification systems, emphasizing current theory and practice.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 332. Correctional Law****3 Credits**

Federal and state laws and rules of post-conviction procedures; rights of the convicted related to sentencing, appeals, clemency, and restoration of rights.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 333. Juvenile Corrections****3 Credits**

Development and implementation of juvenile facilities and community programs. Effectiveness of current corrections practices. Restricted to majors.

**C J 345. Victimology****3 Credits**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 346. Psychology and the Justice System****3 Credits**

Analysis of psychological underpinnings of criminal behavior and the implications of these psychological principles for criminal justice policy. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 347. Sex Crimes****3 Credits**

Dynamics of sex crimes for victims and offenders, plus consideration of the legal and correction systems' response to sex crimes. Restricted to majors.

**C J 348. Serial Killers****3 Credits**

Overview and critical assessment of serial homicide and its relevance for contemporary U.S. society. Focus on factors influencing definitions and cultural understanding of serial homicide.

**Prerequisite(s):** 60 credit hours.

**C J 360. The Juvenile Justice System****3 Credits**

History, development, and philosophy behind a separate juvenile justice system. Role of the juvenile court, evaluation of juvenile law and procedure, and the processing of juvenile offenders.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 380. Introduction to Terrorism****3 Credits**

Overview of the phenomenon of terrorism, psychological and sociological theories of terrorism, and various contemporary governmental policies.

**C J 391. Special Readings in Criminal Justice****1-3 Credits**

Individually chosen subject areas not readily available in other courses. May be repeated for a maximum of 6 credits under different subtitles. Restricted to majors.

**Prerequisites:** at least a 2.5 GPA and consent of instructor.

**C J 393. Internship in Criminal Justice****1-12 Credits**

Field experience in a local, state, or federal criminal justice or private security agency. Includes orientation, observation, conferences, and work experience. Credits limited to six if student has taken C J 293. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.

**Prerequisites:** consent of instructor and GPA of 2.5 or better.

**C J 399. New Mexico Law****3 Credits**

Same as GOVT 399, JOUR 399, SOC 399, and HIST 399.

**C J 405. Juvenile Courts and Law****3 Credits**

History, development, and current status of juvenile courts. Legal status of juveniles in court and constitutional protections afforded them. Restricted to majors.

**C J 410. Criminal Justice Administrative Systems****3 Credits**

Administrative structures in criminal justice agencies and institutions; relationship of administrative structures to practical police, courts, and corrections problems.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 412. Introduction to Security Technology and Loss Prevention****3 Credits**

Private and public responses to security problems, including employee theft, perimeter security, and domestic or foreign terrorism; reviews related law and management practices.

**C J 414. Race, Crime and Justice****3 Credits**

Historical and contemporary analysis of the relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

**C J 416. Global Perspectives on Youth and Drug Use****3 Credits**

Overview of global drug use among young people, comparative legal structures, formal and informal responses. Restricted to C J, ANTH, GOVT, SOC, W S, S WK majors.

**C J 417. Drugs In Our World****3 Credits**

Comparative analysis of patterns and theories of drug use, formal government mitigation strategies.

**C J 424. Forensic Law****3 Credits**

Overview of the rules and issues related to the use of scientific information in the legal process. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** C J major, Forensic Science minors, or consent of instructor.

**C J 425. Issues in Ethics, Law, and Criminal Justice****3 Credits**

Examination of the key ethical and decision-making dilemmas facing professionals working in the field of law and criminal justice.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 427. Race and Crime in Film****3 Credits**

Critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

**Prerequisite(s):** 60 credit hours.

**C J 428. Mexican-American and Issues of Social Justice****3 Credits**

In this course we will explore and discuss social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."

**Prerequisite(s):** Students must have completed C J 300 or research methods equivalent or consent from the instructor.

**C J 429. Immigration & Justice****3 Credits**

This course is designed to introduce undergraduate students to the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

**Prerequisite(s):** Student must have completed C J 300 or Research Methods equivalent or consent of the instructor.

**C J 430. The U.S. Supreme Court and the Criminal Justice System****3 Credits**

History and workings of the U.S. Supreme Court in the context of the criminal justice system from writs of certiorari to last minute appeals in death penalty cases, including study of specific U.S. Supreme Court cases in the areas of criminal law, criminal procedural law, 8th amendment prison sentencing issues, and death penalty cases. Consent of Instructor required. Restricted to: Criminal Justice majors.

**C J 431. Family Violence and the Law****3 Credits**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

**C J 432. Issues in Criminal Justice****3 Credits**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated for unlimited credits under different subtitles.

**C J 434. Probation, Parole, and Community Corrections****3 Credits**

Structure, organization, and operation of probation, parole, and other community-based correctional programs in the U.S. Overview of historical and recent trends in the supervision of offenders in the community and in the development of alternatives to incarceration. Analysis of issues related to community correctional policies and practices. Restricted to majors.

**C J 435. Political Penology****3 Credits**

Comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

**C J 436. Courts and Sentencing****3 Credits**

This course will focus on the structure, organization, and operation of the state and federal court systems in the United States. It examines courtroom decision making and dynamics of courthouse justice—prosecutorial discretion, plea bargaining practices, jury and judicial decision making and sentencing. Additional topics will include racial, gender and class disparities in sentencing outcomes and the impact of recent reforms directed at the criminal court system. Restricted to: Criminal Justice majors.

**C J 437. Wrongful Convictions****3 Credits**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

**C J 440V. Comparative Criminal Justice Systems****3 Credits**

Cross-national study of selected Western and non-Western legal systems. Comparison of structures and functions of police, court systems, and corrections in different systems.

**C J 449. Senior Seminar****3 Credits**

Problems and conflicts encountered in major attempts to control crime. Restricted to majors.

**Prerequisite(s):** C J 101, C J 205, C J 210, C J 230, C J 250, C J 300, C J 301, 90 credit hours completed.

**C J 451. Border Violence and Justice****3 Credits**

Critical analysis of violence and systems of justice along border regions. Examines causes and correlates of violence experienced by those living in border regions and the social responses to that violence.

**C J 453. Women and Justice****3 Credits**

Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors.

**C J 454. Human Trafficking****3 Credits**

Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, W S, S WK majors.

**C J 455. Feminist Research Methods****3 Credits**

Feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as W S 455.

**C J 484. Hate Crimes & Groups****3 Credits**

Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups, and social theories attempting to explain violent hate.

**C J 501. Research Methods in Criminal Justice****3 Credits**

Research design, methods of data collection and analysis, and preparation of research reports. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 511. Nature of Crime****3 Credits**

Defining and measuring crime, crime causation, and criminal behavior systems. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 514. Advanced Race, Crime, and Justice****3 Credits**

Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

**C J 515. A Course on Punishment****3 Credits**

Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system.

**C J 520. Advanced Girls, Women & Crime****3 Credits**

Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, W S majors. Crosslisted with: W S 520

**C J 521. Law and Social Control****3 Credits**

The development and implementation of criminal law. Consideration of functionalist, conflict, and interpretive theories and research. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 524. Forensic Law****3 Credits**

Rules and policy implications related to the use of scientific information in legal process. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 525. Issues in Ethics, Law, and Criminal Justice****3 Credits**

Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors.

**C J 527. Advanced Race & Crime in Film****3 Credits**

Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

**C J 529. Advanced Immigration & Justice****3 Credits**

Advanced analysis of the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

**C J 530. Advanced U.S. Supreme Court and the Criminal Justice System****3 Credits**

Advanced history and workings of the U.S. Supreme Court in the context of the criminal justice system from writs of certiorari to last minute appeals in death penalty cases, including study of specific U.S. Supreme Court cases in the areas of criminal law, criminal procedural law, 8th amendment prison sentencing issues, and death penalty cases. Restricted to: Criminal Justice majors.

**C J 531. Advanced Family Violence and the Law****3 Credits**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

**C J 532. Advanced Issues in Criminal Justice (f, s, sum)****3 Credits**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit.

**C J 535. Advanced Political Penology****3 Credits**

Advanced comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

**C J 537. Advanced Wrongful Convictions****3 Credits**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

**C J 541. Seminar in Criminal Justice Policy Analysis and Planning****3 Credits**

Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and outcomes. Topics announced in the Schedule of Classes. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 545. Advanced Victimology****3 Credits**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes. Same as W S 545.

**C J 554. Advanced Human Trafficking****3 Credits**

Advanced study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, W S, S WK majors.

**C J 555. Advanced Feminist Research Methods****3 Credits**

Advanced feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as W S 555.

**C J 560. Juvenile Justice Systems****3 Credits**

Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. C J 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.

**C J 581. Community Policing****3 Credits**

Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.

**C J 591. Directed Readings in Criminal Justice****3 Credits**

Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.

**C J 592. Independent Research****1-3 Credits**

Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.

**C J 593. Internship****3-6 Credits**

Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisites:** introductory graduate course in the area of the internship and consent of the internship supervisor.

**C J 599. Master's Thesis****15 Credits**

Thesis.

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## Criminal Justice - Bachelor of Criminal Justice

**Departmental Requirements**

<i>Lower Division (100 and 200-level)</i>		
C J 101G	Introduction to Criminal Justice	3
C J 205	Criminal Law	3
<i>Upper-Division (300 and 400-level) <sup>1</sup></i>		
Select 3-4 credits from the following:		3
C J 300	Introduction to Criminal Justice Research	
GOVT 300	Political Research Skills	
PSY 310	Experimental Methods	
SOC 352	Social Research: Methods	
Select 9 credits from the following:		9
C J 301	Advanced Research Methods (or any statistics class)	
C J 302	Crime, Justice and Society	
C J 425	Issues in Ethics, Law, and Criminal Justice	
One course from the following:		3
C J 303	Introduction to Criminological Theory	
C J 304	Historical Perspectives of Criminal Justice Systems	
C J 414	Race, Crime and Justice	
<b>Criminal Justice Electives</b>		
Select 12 credits from upper division Criminal Justice Electives. <sup>2</sup>		12
<b>Nondepartmental Requirements</b>		
Select one of the following:		4-14
Second Language Requirement (see below)		
MATH 191G	Calculus and Analytic Geometry I	
Select two Viewing a Wider World courses <sup>3</sup>		6
Select 3 credits from the following:		3
PHIL 100G	Philosophy, Law and Ethics	
PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	

PHIL 223G	Ethics	
Upper division Philosophy course		
MATH 121G or STAT 251G	College Algebra <sup>3</sup> Statistics for Business and the Behavioral Sciences	3
ENGL 111G	Rhetoric and Composition	4
Select two from the following:		
ENGL 203G	Business and Professional Communication	6
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
<b>General Electives</b>		
Select sufficient credits to bring the total credits to 120, including 48 upper-division credits. <sup>4</sup>		51
Total Credits		110-120

<sup>1</sup> Prior to enrolling in upper division courses, lower division courses must be completed or final courses must be in progress.

<sup>2</sup> Not to include C J 393 Internship in Criminal Justice, or any criminal justice required course. Courses that fall under multiple content areas may only be counted once. Please visit our website for specific courses in each of these content areas <http://crimjust.nmsu.edu>.

<sup>3</sup> Or higher than Math 121G, excluding MATH 210G Mathematics Appreciation, or higher than STAT 251G.

<sup>4</sup> Please visit our website for additional requirements <http://crimjust.nmsu.edu>.

A student must earn a C- or better to receive credit for any departmental and nondepartmental requirement for the BC J degrees.

## Second Language Requirement

For the Bachelor of Criminal Justice with a major in Criminal Justice there is a two year second language requirement (or the completion of MATH 191G), the student must do one of the following:

### Option 1:

Complete one of the following sequences:

CHIN 111 & CHIN 112 & CHIN 211 & CHIN 212	Elementary Chinese I and Elementary Chinese II and Intermediate Chinese I and Intermediate Chinese II	14
FREN 111 & FREN 112 & FREN 211 & FREN 212	Elementary French I and Elementary French II and Intermediate French I and Intermediate French II	14
GER 111 & GER 112 & GER 211 & GER 212	Elementary German I and Elementary German II and Intermediate German I and Intermediate German II	14
JPNS 111 & JPNS 112 & JPNS 211 & JPNS 212	Elementary Japanese I and Elementary Japanese II and Intermediate Japanese I and Intermediate Japanese II	14

SPAN 111 & SPAN 112 & SPAN 211 & SPAN 212	Elementary Spanish I and Elementary Spanish II and Intermediate Spanish I and Intermediate Spanish II	14
PORT 213 & PORT 214	Portuguese for Romance Language Students I and Portuguese for Romance Language Students II	6

### For Heritage Speakers:

SPAN 113 & SPAN 213 & SPAN 214	Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	9
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### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3
C D 476	American Sign Language III	3

### Option 3:

Challenge the 212 level for the following courses:

CHIN 212 or FREN 212 or GER 212 or JPNS 212 or SPAN 212	Intermediate Chinese II Intermediate French II Intermediate German II Intermediate Japanese II Intermediate Spanish II	3
OR		

Challenge the 214 level for the following courses:

PORT 214 or SPAN 214	Portuguese for Romance Language Students II Spanish for Heritage Learners III	3
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### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Child Advocacy Studies - Undergraduate Minor

The interdisciplinary undergraduate minor in Child Advocacy Studies (CAST) provides mandated reporters and responders in social work, public health, nursing, criminal justice, psychology, education, family studies, cooperative extension and other disciplines with evidence-based, culturally relevant knowledge and skills to improve the outcomes for maltreated children in New Mexico or wherever their paths may take them.

The core courses, worth three (3) credits each, will be focused on the needs specific to New Mexico and will adhere to both statewide and national best practice standards on the welfare of children. The remaining nine (9) out of the total of 18 required credits will come from courses that students choose from a list of selected courses already being taught across the campus. To declare this minor please contact the Family and Consumer Sciences department. For more information, please visit: <http://aces.nmsu.edu/academics/FCS/cast.html>

## Forensic Science - Undergraduate Minor

Forensic Science is the application of principles and techniques of scientific analysis in a legal context. Forensic scientists study physical evidence to resolve issues involving criminal investigations, environment analyses and similar areas of research.

A student must pass 18 credits with a grade of C- or higher from the following curriculum to earn the Forensic Science minor. No courses may be taken S/U. Students must take at least 6 credits from departments outside their major(s). At least 9 credits in any minor must be upper division. Students must register in the minor before enrolling in any upper division Criminal Justice courses.

The following curriculum represents minimum requirements for a minor. Students interested in a career in Forensic Science are encouraged to take additional courses from those listed below.

**The Forensic Minor requires courses from three sections: (1) 6 credits from the list of Core Courses; (2) 3 credits from an additional course not already completed; and (3) 9 credits from one of the four tracks listed below.**

### Core Courses

Select 6 credits from the following: 6

C J 306	Criminal Procedural Law
C J 321	Criminal Investigation and Intelligence
C J 424	Forensic Law
PHYS 304	Forensic Physics

### Additional Course

Select 3 credits from areas I or II above not already completed. 3

Total Credits 9

## Track A: Laboratory Analysis

Students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Select one from the following: 4-5

BIOL 221 & 221 L	Introductory Microbiology and Introductory Microbiology Laboratory
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BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory
Select 4-5 credits from the following: 4-5	
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology
BCHE 395	Biochemistry I
BCHE 396	Biochemistry II
CHEM 371	Analytical Chemistry
TOX 361	Basic Toxicology
TOX 461	Toxicology I
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory
Total Credits	8-10

## Track B: Human Forensic Analysis

Honors, Special Topics, or Independent Studies courses if approved by Academic Head, Department of Criminal Justice.

Select 9 credits from the following: <sup>1</sup> 9

ANTH 130G & 130GL	Human's Place in Nature: Introduction to Biological Anthropology and Human's Place in Nature Laboratory
ANTH 315	Introduction to Archaeology
ANTH 355	Physical Anthropology
ANTH 357V	Medical Anthropology
ANTH 388	Intermediate Archaeological Field School
ANTH 474	Human Osteology <sup>2</sup>
ANTH 477	Zooarchaeology
Total Credits	9

<sup>1</sup> Recommended sequence ANTH 130G Human's Place in Nature: Introduction to Biological Anthropology/ANTH 130GL Human's Place in Nature Laboratory, ANTH 355 Physical Anthropology or ANTH 315 Introduction to Archaeology, and then ANTH 474 Human Osteology.

<sup>2</sup> Courses have prerequisites, and students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

## Track C: Forensic Psychology

Students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

### Required Courses

Select three from the following: 9

<i>Principles of Behavior</i>	
PSY 317	Social Psychology
PSY 321	Psychology of Personality
PSY 324	Sexual Behavior
PSY 330	Psychology and the Law
PSY 376	Evolutionary Psychology

### *Psychological Treatment*

PSY 302	Abnormal Psychology
PSY 445	Clinical Psychology

C J 346	Psychology and the Justice System	
Total Credits		9

### Track D: General

Select 9 credits from the following:		9
ANTH 474	Human Osteology <sup>3</sup>	
C J 306	Criminal Procedural Law	
C J 307	Law of Evidence	
C J 321	Criminal Investigation and Intelligence	
C J 346	Psychology and the Justice System	
C J 424	Forensic Law	
PSY 330	Psychology and the Law <sup>3</sup>	
PHYS 304	Forensic Physics	
Total Credits		9

<sup>3</sup> Courses have prerequisites, and students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

## Law and Society - Undergraduate Supplemental Major

The Law and Society Program is administered by the Department of Government and offers an interdisciplinary major for students interested in pursuing law school or careers that incorporate a strong legal element, such as government, law enforcement, business and social work. As a supplementary major, it must be taken in conjunction with a regular major. Some courses may double-count toward a student's regular major or General Education requirements. Students should check with academic advisors in their primary major. To declare this supplemental major please contact the College of Arts & Sciences Student Records Office. For more information please visit: <https://deptofgov.nmsu.edu/academic-programs/law-society/>.

## Criminal Justice - Master of Criminal Justice

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please contact the director of the MCJ program or consult the Department of Criminal Justice website (<http://crimjust.nmsu.edu/criminal-justice-graduat>) for details.

### Thesis Option (33 Credits)

Thesis students must submit a thesis proposal to their faculty committee for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination minimally includes a defense of the completed thesis, but may also include a general examination based upon the candidate's program of study. The minimum coursework requirements are displayed below.

<b>Required Courses</b>		15
C J 511	Nature of Crime	
C J 514	Advanced Race, Crime, and Justice	
or C J 521	Law and Social Control	
C J 525	Issues in Ethics, Law, and Criminal Justice	
C J 501	Research Methods in Criminal Justice	
or C J 555	Advanced Feminist Research Methods	
C J 541	Seminar in Criminal Justice Policy Analysis and Planning	
<b>Master's Thesis Credits</b>		
C J 599	Master's Thesis	6
<b>General Electives</b>		
Select 12 credits from General Electives. <sup>1</sup>		12
Total Credits		33

<sup>1</sup> Students may not count C J 593 Internship or C J 592 Independent Research credit toward their elective requirement. No more than three total credits of C J 591 Directed Readings in Criminal Justice coursework may be used as electives; a minimum of 3 of the 12 credit general elective requirement must come from the Department of Criminal Justice.

A minor is optional (contact the director of the MCJ program or consult the Department of Criminal Justice web site, <https://crimjust.nmsu.edu/>, for details) and may result in more than 33 total credits for the degree.

### Focused Coursework Option (36 Credits)

Focused coursework students must pass a written comprehensive examination following completion of the required courses. Students not passing the examination will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

<b>Required Courses</b>		15
C J 511	Nature of Crime	
C J 514	Advanced Race, Crime, and Justice	
or C J 521	Law and Social Control	
C J 525	Issues in Ethics, Law, and Criminal Justice	
C J 501	Research Methods in Criminal Justice	
or C J 555	Advanced Feminist Research Methods	
C J 541	Seminar in Criminal Justice Policy Analysis and Planning	
<b>C J Electives</b>		
Select 12 credits from electives from courses offered by the Department of Criminal Justice, to be selected in consultation with a student's advisor. <sup>2</sup>		12
<b>General Electives/Minor</b>		
An additional 9 credits of electives, to be selected in consultation with a student's advisor. <sup>3</sup>		9
Total Credits		36

<sup>2</sup> No more than three total credits of C J 593 Internship or C J 591 Directed Readings courses may be used as Criminal Justice electives. C J 592 Independent Research may not be used as Criminal Justice Electives for this option.

<sup>3</sup> No more than three credits of C J 593 Internship or C J 591 Directed Readings may be used to fulfill the general elective requirement. C J 592 Independent Research may not be used as Criminal Justice Elective for this option.

A minor is optional (contact the director of the MCJ program or consult the Department of Criminal Justice web site, <http://crimjust.nmsu.edu/degrees.htm>, for details) and may result in more than 36 total credits for the degree.

## Minimum Grade Requirement

Students must earn a minimum B- grade in all required core courses. This applies to both options: Thesis and Focused Coursework as well as to both programs: On-Campus (traditional) and Online.

# Economics, Applied Statistics, and International Business

## Undergraduate Program Information

The Department of Economics, Applied Statistics and International Business in the College of Business offers an economics major to Bachelor of Arts candidates in the College of Arts and Sciences. (Additional information may be found under the Economics and International Business (p. 440) section in the College of Business chapter).

## Degrees for the Department

Economics - Bachelor of Arts (p. 282)

## Minors for the Department

Economics - Undergraduate Minor (p. 282)

## Economics Courses

### ECON 201G. Introduction to Economics

#### 3 Credits

Economic institutions and current issues with special emphasis on the American economy.

### ECON 251G. Principles of Macroeconomics

#### 3 Credits

Macroeconomic theory and public policy: national income concepts, unemployment, inflation, economic growth, and international payment problems.

### ECON 252G. Principles of Microeconomics

#### 3 Credits

Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions.

### ECON 304. Money and Banking

#### 3 Credits

Income measurement and determination, monetary and fiscal policies.

**Prerequisite:** ECON 251G or equivalent, or consent of instructor.

### ECON 311. Intermediate Macroeconomic Theory

#### 3 Credits

Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.

**Prerequisite(s):** ECON 251G or equivalent.

### ECON 312. Intermediate Microeconomic Theory

#### 3 Credits

Contemporary economic theory with emphasis upon value and distribution.

**Prerequisite(s):** ECON 252G or equivalent.

### ECON 324V. Developing Nations

#### 3 Credits

Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

### ECON 325V. Economic Development of Latin America

#### 3 Credits

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems.

### ECON 332. Public Finance

#### 3 Credits

This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 252

### ECON 335V. Business and Government

#### 3 Credits

Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGT 335G

### ECON 336. Labor Economics

#### 3 Credits

This course aims at developing students' understanding of how the labor market works. Topics to be covered include: labor supply and demand, wage differentials, wage structure, unemployment, gender issues, labor market discrimination, and migration.

**Prerequisite(s):** ECON 252G.

### ECON 337V. Natural Resource Economics

#### 3 Credits

Same as AG E 337V.

**Prerequisite:** ECON 201 or ECON 252.

### ECON 340. American Economic History

#### 3 Credits

The rise of big business and organized labor, increasing price rigidities, and growing government intervention. Same as HIST 340.

**ECON 384V. Water Resource Economics****3 Credits**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AG E 384V.

**Prerequisite:** AG E 100 or ECON 252G.

**ECON 401. Managerial Economics****3 Credits**

Application of economic theory to problems of business management.

**Prerequisite(s):** ECON 252G and MATH 142 or equivalent, or consent of instructor.

**ECON 404. Collegiate Advisory Board, Federal Reserve****3 Credits**

Students serve on the Collegiate Advisory Board of the El Paso branch of the Federal Reserve Bank of Dallas. Guest speakers provide an overview of the Federal Reserve System, role of monetary policy, and issues facing specific industries in the local, national, and global economies. Students prepare reports, including a final paper, on an assigned industry in the regional or state economy and the current economic performance of their industry. Students must be of junior rank or higher with a GPA of at least 3.5. Consent of Instructor required.

**ECON 405. Introductory Econometrics****3 Credits**

Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.

**Prerequisite(s):** A ST 251G or STAT 251G or A ST 311 (or equivalent).

**ECON 406. The Economics of Sports****3 Credits**

Applying the tools of economic analysis to a particular industry and gaining an in-depth knowledge of the interaction of professional sports teams and leagues with the economy and society. Same as AG E 406.

**Prerequisites:** one previous course in economics or consent of instructor.

**ECON 432V. Economics of Health Care****3 Credits**

Analysis of the allocation of resources in the field of health and medical care.

**ECON 449. Open Economy Macroeconomics****3 Credits**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.

**Prerequisite(s):** FIN 341 OR ECON 311.

**ECON 450. International Economics****3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450

**Prerequisite(s):** ECON 251G and ECON 252G.

**ECON 457. Mathematical Economics****3 Credits**

Application of mathematical tools, especially the calculus, to economic theory.

**Prerequisite:** one upper-division economics course.

**ECON 489. Senior Economics Seminar****3 Credits**

Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics.

**Prerequisite(s):** ECON 311 or ECON 312.

**ECON 490. Selected Topics****1-3 Credits**

Current topics in economics. Subject matter to be designated for each semester.

**ECON 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.

**Prerequisite:** junior or above standing and consent of instructor.

**ECON 503. Managerial Economics****3 Credits**

Theory and application of microeconomics to the management of organizations.

**Prerequisite(s):** A ST 251G or 311 or equivalent with B or better.

**ECON 545. Econometrics II****3 Credits**

Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

**Prerequisite(s):** ECON 251G, ECON 252G, STAT 251G or A ST 311, and AEEC 540.

**ECON 550. Special Topics****1-3 Credits**

Seminars in selected current topics in the various areas of economics.

Prerequisites vary according to the topic being offered.

**ECON 571. Regulatory Policy and Industry Analysis: Electricity I****3 Credits**

Regulatory policy and economic analysis related to the Electric Industry.

Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

**Prerequisite(s):** .

**ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas****3 Credits**

Regulatory policy and economic analysis related to the Natural Gas and Water industries.

Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

**ECON 573. Regulatory Policy and Industry Analysis: Electricity II**  
**3 Credits**

Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.

**Prerequisite(s):** ECON 571 or consent of instructor.

**ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis**  
**3 Credits**

Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.

**Prerequisite(s):** ECON 571 or consent of instructor.

**ECON 581. International Economics**  
**3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations.

**Prerequisite(s):** ECON 311 and ECON 312.

**ECON 582. Economics of Health Care**  
**3 Credits**

Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.

**ECON 596. Independent Study**  
**3 Credits**

Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

**Phone:** (575) 646-2113

**Website:** <http://business.nmsu.edu/academics/economics-ib/>

## Economics - Bachelor of Arts

The study of economics can lead to career positions in economics and related managerial and technical specialties in businesses, financial institutions, government and education. Qualified students are also prepared for graduate study in economics, business administration including management and law. Students who plan to pursue graduate work in economics or to become professional economic analysts should consider taking supplementary courses in accounting, computer science, mathematics, quantitative economics and/or statistics, in addition to those listed below as required.

## Requirements

A student must earn a grade of C- or better in the nondepartmental requirements, and a cumulative GPA of 2.5 in the 27 hours of departmental requirements.

<b>General Education Courses</b>	35
<b>Viewing a Wider World Courses</b>	6
<b>Nondepartmental Requirements</b>	
ACCT 221	Principles of Accounting I (Financial) 3
MATH 120	Intermediate Algebra 3
MATH 142G	Calculus for the Biological and Management Sciences 3
MATH 121G	College Algebra 3
STAT 251G	Statistics for Business and the Behavioral Sciences 3
or A ST 311	Statistical Applications
<b>Departmental Requirements</b>	
ECON 251G	Principles of Macroeconomics 3
ECON 252G	Principles of Microeconomics 3
ECON 304	Money and Banking 3
ECON 311	Intermediate Macroeconomic Theory 3
ECON 312	Intermediate Microeconomic Theory 3
ECON 405	Introductory Econometrics 3
ECON 457	Mathematical Economics 3
ECON 489	Senior Economics Seminar 3
Select 9 additional credits numbered 300 or above, including at least one course from the following to bring total upper-division in major to 27:	9
ECON 332	Public Finance
ECON 336	Labor Economics
ECON 449	Open Economy Macroeconomics
ECON 450	International Economics
<b>Electives</b>	
Select sufficient electives to bring total credits to 120, including 48 upper-division.	31
<b>Second Language Requirement: (not required)</b>	
<b>Total Credits</b>	<b>120</b>

### Second Language Requirement

For the Bachelor of Arts in Economics with a major in Economics there is no second language requirement for the degree.

## Economics - Undergraduate Minor

A minor in economics consists of 18 or more credit hours of approved course work in economics of which at least 12 are numbered 300 or higher, all completed with a grade of C- or higher. Please note that the minor in economics is not available to Bachelor of Individualized Studies (BIS) or Bachelor of Applied Studies (BAS) students.

### Required Courses

ECON 251G	Principles of Macroeconomics 3
ECON 252G	Principles of Microeconomics <sup>1</sup> 3
ECON 304	Money and Banking 3
ECON 401	Managerial Economics 3
Select 6 credits from any upper-division economics courses (numbered 300 or higher).	6
<b>Total Credits</b>	<b>18</b>

<sup>1</sup> ECON 201G Introduction to Economics, may be substituted for one of these with the approval of the department head.

## English

### Undergraduate Program Information

The Department of English offers the Bachelor of Arts (BA) in English as the cornerstone of studies in the humanities. This rich and versatile major provides students with a source of personal enrichment as well as verbal, analytical and cultural skills that are readily adaptable to a variety of careers. The English curriculum includes courses in literature, language, creative writing, technical and professional communication, rhetoric, cultural studies, digital media and film. Our majors go on to succeed in a wide range of professions, including secondary and post-secondary education, business, government, publishing and law. We offer four different major concentrations that students can tailor to their individual needs, in:

1. English,
2. Creative Writing,
3. Literature, Language, and Culture, and
4. Rhetoric, Digital Media and Professional Communication.

The department provides strong and personalized advising designed to help students reach their full academic potential and future career goals.

The department also offers minors in:

- English;
- creative writing;
- literature;
- medieval and Early Modern studies; and
- rhetoric and professional communication.

Further information about career opportunities, concentrations and minors is available from the Department of English. Students who wish to pursue English as a double major may eliminate one elective from the departmental requirements. Students are required to fulfill a second language requirement of one year.

### Graduate Program Information

Graduate coursework in the Department of English spans a diverse field of studies in culture, rhetoric, literature, digital media, composition pedagogy, professional communication, and writing. The department offers three graduate degrees: the Master of Arts in English, Master of Fine Arts in Creative Writing, and Doctor of Philosophy in Rhetoric and Professional Communication. Students pursuing the MA in English may specialize in any of four areas: Creative Writing, Literature, Rhetoric and Professional Communication, or English Studies for Teachers. These graduate degrees prepare students to succeed in a variety of careers, including writing, editing, publishing, secondary and post-secondary education, business and industry, media, web design, government, nonprofits, and law. Students work closely with faculty advisors to develop programs of study that fit their individual needs and goals.

Students wishing to apply to the MA, MFA, or PhD should consult application information on the English Department website at <http://english.nmsu.edu/apply/>. Applicants are due by January 15th for the MFA and by February 1st for the PhD. Review of MA applications begins on October 1st for spring admission and February 1st for fall admission.

Support in the form of a Graduate Assistantships awarded through

a competitive selection process; this application is folded into the application for admission and should be submitted by the February 1st deadline. Students in the MFA, PhD, and MA emphases in Literature and Rhetoric and Professional Communication are eligible to apply for a Graduate Assistantship. All Graduate Assistantships in English begin in the fall semester.

### Degrees for the Department

English - Bachelor of Arts (p. 293)

English - Master of Arts (p. 299)

Creative Writing - Master of Fine Arts in Creative Writing (p. 301)

Rhetoric and Professional Communication - Doctor of Philosophy (p. 301)

### Minors for the Department

Creative Writing - Undergraduate Minor (p. 296)

English - Undergraduate Minor (p. 297)

Literature - Undergraduate Minor (p. 297)

Medieval and Early Modern Studies - Undergraduate Minor (p. 298)

Rhetoric and Professional Communication - Undergraduate Minor (p. 299)

#### Professor Elizabeth Schirmer, Interim Department Head

**Professors** Thatcher, Wojahn; **Associate Professors** Bradburd, Cull, Garay, Greenfield, Miller-Tomlinson, Rourke, Schirmer, Voisine, Wojahn; **Assistant Professors** Banazek, Lavender-Smith, Sharp-Hoskins, Stagliano, Stolte, Wells; **College Associate Professor** Brown; Poole **College Assistant Professors** Conley, Lanier; **College Instructor** Gray

*E. Schirmer, Interim Department Head, Ph.D. (California-Berkeley)– medieval literature; B. Thatcher, Ph.D. (Purdue)– professional communication, intercultural rhetoric; L. Rosenberg, Associate Department Head, Writing Program Director, Ph.D. (Massachusetts)–composition, literacy studies; R. Bradburd, M.F.A. (New Mexico State)– creative writing: fiction, creative nonfiction; R. Cull, Ph.D. (Illinois)– modern and contemporary American literature; J. Garay, Ph.D. (Arizona State)– Chicano/a and Latino/a literature; C. Gray, M.F.A. (New Mexico State)– creative writing, fiction; R. Greenfield, Ph.D. (Denver)– creative writing: poetry; C. Lanier, Ph.D. (New Mexico State)– rhetoric and professional communication; T. Miller-Tomlinson, Ph.D. (Yale)– Shakespeare, early modern literature and culture; B. Rourke, Ph.D. (Stanford)– modern British literature, critical theory; E. Schirmer, Ph.D. (California-Berkeley)– medieval literature; K. Sharp-Hoskins, Ph.D. (Illinois-State)– rhetoric, composition, culture, pedagogy; A. Stagliano, Ph.D. (South Carolina)– rhetoric, media and technology theory, posthumanities; T. Stolte, Ph.D. (British Columbia)– 19th-century British literature and culture; C. Voisine, Ph.D. (Utah)– creative writing: poetry, creative nonfiction; J. Wells, Ph.D. (South Carolina) – rhetorical theory and history, environmental rhetoric; P. Wojahn, Ph.D. (Carnegie Mellon)– professional communication, computers and writing*

## English Courses

### ENGL 111 M. Rhetoric and Composition for International and Multilingual Students

#### 4 Credits

For international and multilingual students. Students will build on your prior knowledge of writing in English as a second or additional language by engaging in several genres of writing and reading, including reading responses, discussion posts, formal academic papers (Rhetorical Analysis and Documented Argument), and peer review. Your instructor and classmates will serve as your readers and will give you helpful and constructive criticism, which will in turn assist you in becoming a more fluent and engaging communicator in English. Fulfills English 111 Gen-ed requirement. Restricted to Las Cruces campus only.

**Prerequisite(s):** CBT/PB score of 500, or IBT score of 61, or SPCD 110, or consent of instructor.

### ENGL 111G. Rhetoric and Composition

#### 4 Credits

Skills and methods used in writing university-level essays.

**Prerequisite(s):** ACT standard score in English of 16 or higher or a Compass score 76 or higher; for those scoring 13-15 in English on the ACT or 35-75 on the Compass, successful completion of a developmental writing course; for those scoring 12 or below on the ACT standard score in English or 34 or below on the Compass, successful completion of two developmental writing courses.

### ENGL 111GH. Rhetoric and Composition Honors

#### 4 Credits

Individualized assignments and independent study. Satisfies 4 credits of General Education English Composition requirement.

**Prerequisite:** ACT standard English score of 25 or higher and departmental approval.

### ENGL 112. Rhetoric and Composition II

#### 2 Credits

A continuation of English 111G for those desiring more work in composition. Weekly themes based on outside reading.

**Prerequisite:** successful completion of ENGL 111G or the equivalent.

### ENGL 115G. Perspectives on Literature

#### 3 Credits

Examines literature by writers from culturally diverse backgrounds and from different cultural and historical contexts. Explores various strategies of critical reading.

### ENGL 116G. Perspectives on Film

#### 3 Credits (3+3P)

Explores narrative and documentary film and examines significant developments in the history of cinema. Criticism of film as an art form, technical enterprise, business venture, and cultural phenomenon.

### ENGL 203G. Business and Professional Communication

#### 3 Credits

Effective writing for courses and careers in business, law, government, and other professions. Strategies for researching and writing correspondence and reports, with an emphasis on understanding and responding to a variety of communication tasks with a strong purpose, clear organization, and vigorous professional style. May be repeated up to 3 credits.

**Prerequisite(s):** Grade of C- or better in ENGL 111G or SPCD 111G or ENGL 111 M.

### ENGL 211G. Writing in the Humanities and Social Sciences

#### 3 Credits

Theory and practice in interpreting texts from various disciplines in the humanities and social sciences. Strategies for researching, evaluating, constructing, and writing researched arguments. Course subtitled in the Schedule of Classes. May be repeated up to 3 credits.

**Prerequisite(s):** Grade of C- or better in ENGL 111G or ENGL 111M.

### ENGL 218G. Technical and Scientific Communication

#### 3 Credits

Effective writing for courses and careers in sciences, engineering, and agriculture. Strategies for understanding and presenting technical information for various purposes to various audiences. May be repeated up to 3 credits.

**Prerequisite(s):** Grade of C- or better in ENGL 111G or ENGL 111M.

### ENGL 220G. Introduction to Creative Writing

#### 3 Credits

Examines classic and contemporary literature in three genres. Various forms, terminologies, methods and technical aspects of each genre, and the art and processes of creative writing. May be repeated up to 3 credits.

**Prerequisite(s):** ENGL 111G or SPCD 111G or ENGL 111 M.

### ENGL 232. Script Development and Storyboarding

#### 3 Credits

Examines effective writing principles for creating storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Crosslisted with: CMI 232.

### ENGL 235. Narrative: Principles of Story Across the Media

#### 3 Credits

Examines the various strategies of written and visual storytelling, narrative structure and its principal components (plot, theme, character, imagery, symbolism, point of view) with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwrighting, writing for documentaries and animation, etc. Crosslisted with: CMI 235

### ENGL 243. The Bible as Literature

#### 3 Credits

Develops informed readings of Hebrew and Christian scriptures. Emphasizes understanding Biblical literary forms, techniques, themes; historical, cultural contexts for interpretation; authorship, composition, audience for individual books; development of Biblical canon.

### ENGL 244G. Literature and Culture

#### 3 Credits

Intensive reading of and discussion and writing about selected masterpieces of world literature. Emphasizes cultural and historical contexts of readings to help students appreciate literary traditions. Core texts include works by Homer, Dante, and Shakespeare, a classic novel, an important non-Western work, and modern literature.

### ENGL 251. Survey of American Literature I

#### 3 Credits

From the colonial period to the transcendentalists.

### ENGL 252. Survey of American Literature II

#### 3 Credits

From Whitman to the present.

**ENGL 263. History of Argument****3 Credits**

Investigates the major figures and movements in rhetoric from the classical period to modern rhetorical theory, examining relations between rhetorical teaching and practice, culture, epistemology, and ideology. Main campus only.

**Prerequisite(s):** ENGL 111G.

**ENGL 271. Survey of English Literature I****3 Credits**

From Beowulf through the eighteenth century.

**ENGL 272. Survey of English Literature II****3 Credits**

From the pre-Romantics to the present.

**ENGL 299. Special Topics****1-3 Credits**

Emphasis on a literary and/or writing subject chosen for the semester. Repeatable for a unlimited credit under different subtitles.

**ENGL 301. Theory and Criticism: Rhetoric and Culture****3 Credits**

Introduction to rhetorical criticism with an emphasis on understanding the theoretical and cultural underpinnings for the rhetorical analyses of texts.

**ENGL 302. Theory and Criticism: Literature and Culture****3 Credits**

Introduction to literary criticism, from its classical beginnings through contemporary critical approaches.

**ENGL 303. Theory and Criticism: Film, Media and Culture****3 Credits**

Surveys classical and contemporary film theory. Explores the relationship of theory to textual analysis and filmmaking practices. Includes auteurism semiotics, psychoanalysis, and other theories, as well as theories of other media.

**ENGL 304. Creative Writing: Prose****3 Credits**

Imaginative writing, chiefly prose narrative. Repeatable for a maximum of 9 credits.

**ENGL 305. Creative Writing: Reading Series****1 Credit**

A one credit class based on the English Department's literary reading series. The class meets online and at the literary readings.

**ENGL 306. Creative Writing: Poetry****3 Credits**

Introduction to the writing of poetry. Repeatable for a total of 9 credits.

**ENGL 307. Creative Writing: Creative Nonfiction****3 Credits**

Introduction to creative nonfiction. Skills emphasized will include the personal voice, powers of observation and reflection, advocacy, argument, and a creative, powerful use of language. Repeatable for a maximum of 9 credits.

**ENGL 308. Creative Writing: Playwriting****3 Credits**

Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: THTR 308

**ENGL 309. Screenwriting I****3 Credits**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Consent of instructor required. Crosslisted with: CMI 309 and THTR 306

**Prerequisite(s):** ENGL 235 or CMI 235.

**ENGL 310. Critical Writing****3 Credits**

A course in critical reading, writing, and research designed to prepare English majors for upper-division courses.

**ENGL 311G. Advanced Composition****3 Credits**

Writing of nonfiction prose. Reviews principles of expository and descriptive writing. Emphasizes the argument/persuasion essay with detailed discussion of semantic and rhetorical techniques.

**Prerequisite:** junior or senior standing, or consent of instructor.

**ENGL 315. Writing for the Web****3 Credits**

Introduction to writing for the World Wide Web through practical application and analysis on both theory and research. Allows hands-on learning in a computer classroom.

**ENGL 318G. Advanced Technical and Professional Communication****3 Credits**

Theory and practice of writing in technical and professional fields, individualized to each student's field. Emphasizes efficient writing processes and effective written products.

**Prerequisite:** junior or above standing, or consent of instructor.

**ENGL 321V. Modern European Drama****3 Credits**

Masterworks of European drama from the late 18th century to present. Crosslisted with: THTR 321V

**ENGL 322. Dramatic Character****3 Credits**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. Crosslisted with: THTR 322.

**ENGL 323. American Drama****3 Credits**

Masterworks of American drama by noted American playwrights. Crosslisted with: THTR 323

**ENGL 326. Cultural Identity and Representation Across the Media****3 Credits**

Considers complex relationships between representation and culture including how images and language shape racial, ethnic, gender, sexual, and class identities. Examines theories from several disciplines. Includes lecture, discussion and production exercises.

**ENGL 327V. Shakespeare around the Globe****3 Credits**

Introduction to multicultural issues in Shakespeare's plays and to adaptations of Shakespeare's plays in other cultures.

**ENGL 328V. Literature of Science Fiction and Fantasy****3 Credits**

Survey and critical examination of the development of science fiction and fantasy as literature genres through selected authors and texts.

**ENGL 329. Studies in Drama****3 Credits**

Emphasis on a group of related works of European or American drama; topics will vary. Crosslisted with: THTR 329 and CMI 329

**ENGL 330V. Studies in Poetry****3 Credits**

Emphasis on a related group of poems or on the work of one or more poets; topics will vary.

**ENGL 335V. Studies in the Novel****3 Credits**

Intensive reading of, discussion of, and writing about selected major novels from around the world. Emphasizes the history of the novel and its role in culture.

**ENGL 336. Studies in Film****3 Credits (3+3P)**

Explores the conventions of cinematic representation; the strategies involved in writing about and reading film; and/or the adaptation of literary texts to film. Repeatable under different subtitles.

**ENGL 339V. Chicana/o Literature****3 Credits**

Introduction to Chicano novels, short stories and selected creative nonfiction.

**ENGL 341V. American Indian Literature****3 Credits**

Forms and themes of Native American oral literary traditions; Native American writing in English, especially novels, short fiction, and poetry.

**ENGL 349. The Short Story****3 Credits**

Development of the short story as a distinct form. Readings and critical analysis of representative nineteenth and twentieth century pieces.

**ENGL 354. Form and Technique in Fiction****3 Credits**

Literature course designed for fiction writers, especially those English majors in the Creative Writing emphasis. The course combines the study of published fiction with the study of craft. Some of the assignments will require the student to write original fiction based on exercises provided by the instructor. Repeatable for up to 9 credits.

**ENGL 356. Form and Technique in Poetry****3 Credits**

Literature course designed for poets, especially those English majors in the Creative Writing emphasis. The course combines the study of published poetry with the study of craft. Some of the assignments will require the student to write original poems based on exercises provided by the instructor. Repeatable for up to 9 credits.

**ENGL 358. Form and Technique in Playwriting****3 Credits**

Literature course designed for playwrights, especially those English majors in the Creative Writing emphasis. The course combines the study of published plays and performances with the study of craft. Some of the assignments will require the student to write original plays based on exercises provided by the instructor. Repeatable up to 9 credits.

**ENGL 363. Literature for Children and Young Adults****3 Credits**

A comparative, historical survey of literature for young (K to 12th grade) readers. Emphasis on critical evaluation.

**Prerequisite:** junior or above standing.

**ENGL 380V. Women Writers****3 Credits**

Introduction to multicultural women's traditions through intensive study of works by women writers. Crosslisted with: W S 380V.

**ENGL 392V. Mythology****3 Credits**

Greek and Roman mythology and its impact on European and English literature. Readings in myths, classical plays, and other literature with mythological interest, including nonclassical myths.

**ENGL 394V. Southwestern Literature****3 Credits**

Introduction to multicultural literature of the Southwest: oral folk literature, literary fiction (classic and contemporary), nonfiction and poetry.

**ENGL 399. Special Topics****3 Credits**

Emphasis on a theme, genre, figure, or technique chosen for study during the semester. Repeatable under different subtitles.

**ENGL 400. Independent Study: Upper Division****1-3 Credits**

For students with demonstrated aptitude for independent work. Approval of instructor required before registration. Repeatable under different subtitles.

**ENGL 405. Chaucer****3 Credits**

Principal works, with emphasis on *The Canterbury Tales*.

**ENGL 407. Milton****3 Credits**

Studies in Milton's works.

**ENGL 408. Shakespeare I****3 Credits**

Principal plays of Shakespeare's first two periods. Crosslisted with: THTR 408.

**ENGL 409. Shakespeare II****3 Credits**

Principal plays of Shakespeare's last two periods. Crosslisted with: THTR 409.

**ENGL 412. Writing in the Workplace****3 Credits**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

**ENGL 413. Advanced Creative Writing: Prose Workshop****3 Credits**

Imaginative writing, chiefly the narrative. May be repeated up to 12 credits.

**Prerequisite(s):** ENGL 304 or consent of instructor.

**ENGL 414. Advanced Creative Writing: Poetry Workshop****3 Credits**

For advanced writers of poetry. Repeatable for a total of 12 credits.

**Prerequisite(s):** ENGL 306 or consent of instructor.

**ENGL 415. Advanced Creative Writing: playwriting Workshop****3 Credits**

Technique of full-length playwriting, and analysis of dramatic structure.

May be repeated up to 12 credits. Consent of Instructor required.

Crosslisted with: THTR 309 and CMI 309.

**Prerequisite(s):** ENGL 308 or consent of instructor.

**ENGL 416. Approaches to Literature****3 Credits**

Understanding, appreciation, techniques of instruction in the high school.

**Prerequisite:** at least 6 credits in upper-division English courses.

**ENGL 417. Advanced Study in Critical Theory****3 Credits**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301-303, strongly recommended. Repeatable under different subtitles.

**ENGL 418. History of Rhetoric****3 Credits**

Investigation of crucial writings that have shaped Western attitudes towards and practice of rhetoric. Will examine key concepts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

**ENGL 419. Modern Rhetorical Theory****3 Credits**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the twentieth century.

**ENGL 421. Advanced Study in a Literary Period or Movement****3 Credits**

Close study of a historical or theoretical topic in a particular literary period or movement. Repeatable under different subtitles.

**ENGL 422. Advanced Study in a Literary Form or Genre****3 Credits**

Close study of a topic in a particular literary form or genre. May be repeated under different subtitles.

**ENGL 423. Advanced Study in a Major Author****3 Credits**

Close study of selected works by a major author. May be repeated under different subtitles.

**ENGL 424. Advanced Study in a Major Text****3 Credits**

Close study of a major text. Course subtitled in the Schedule of Classes. Repeatable under different subtitles.

**ENGL 425. Advanced Study in Comparative Literature****3 Credits**

Close study of a selection of non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Repeatable under different subtitles.

**ENGL 427. Advanced Study in Film and Digital Media****3 Credits**

Offers close study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester. Repeatable under different subtitles Crosslisted with: ENGL 527.

**ENGL 429. British Romanticism****3 Credits**

Intensive study of major writers and critical topics from the Romantic period. Repeatable under different subtitles.

**ENGL 430. Online Publishing****3 Credits**

This three-credit course provides a theoretical background for online publishing and design as well as hands on experience publishing an online arts magazine.

**ENGL 431. Technical Editing****3 Credits**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

**ENGL 432. Gothic Literature****3 Credits**

Intensive study of gothic literature in particular historical, aesthetic, cultural, or intellectual contexts, such as American Gothic, Female Gothic, Dark Romanticism, or Vampire Literature. Repeatable under different subtitles.

**ENGL 433. Victorian Literature****3 Credits**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

**ENGL 438. Literature of the American Renaissance****3 Credits**

Intensive study of topics critical to the development of nineteenth century American literature before and during the Civil War, and the work of authors such as Emerson, Thoreau, Poe, Hawthorne, Melville, Whitman and Dickinson. Repeatable once under a different subtitle.

**ENGL 442. Modern and Contemporary American Poetry****3 Credits**

Studies the development of American poetry from World War I to the present. Repeatable once under a different subtitle.

**ENGL 444. Modern British Fiction****3 Credits**

Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable once under a different subtitle.

**ENGL 445. Postmodern Fiction****3 Credits**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable once under a different subtitle.

**ENGL 446. Advanced Creative Writing: Nonfiction Prose****3 Credits**

This workshop-format class for advanced writers will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 546. May be repeated up to 12 credits.

**Prerequisite(s):** ENGL 307 or consent of instructor.

**ENGL 449. Advanced Study in Writing****3 Credits**

Close study of a topic in composition, rhetoric and/or technical and professional communication. Repeatable for a maximum of 6 credits with permission of department.

**ENGL 451. Practicum in the Grammar of American English****3 Credits**

Studies of formal grammar of the English language in preparation for the teaching of the English language and/or advanced linguistic analysis.

**ENGL 452. History of the English Language****3 Credits**

This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

**ENGL 453. World Literatures****3 Credits**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable once under a different subtitle.

**ENGL 458. Latino/a Literature and Culture****3 Credits**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.

**ENGL 460. Proposal Writing****3 Credits**

Developing proposals and grants in a workshop setting.

**ENGL 462. Interdisciplinary, Client-Based Project Practicum****3 Credits**

Hands-on experience in designing projects within interdisciplinary teams for organizational clients. Taught with ENGL 562.

**ENGL 463. Advanced Study in English Literature****3 Credits**

Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

**ENGL 469. Advanced Study in American Literature****3 Credits**

Covers selected works for a particular period of American literary history. Repeatable under different subtitles.

**ENGL 470. Approaches to Composition****3 Credits**

Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.

**ENGL 478. Document Design****3 Credits**

Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.

**ENGL 479. Computers and Writing****3 Credits**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

**ENGL 480. Screenwriting II****3 Credits**

Students will write two short scripts, 10-15 pages each. Focus will be on learning how to take notes and rewrite. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialog, character development, etc. Crosslisted with: CMI 480

**Prerequisite(s):** ENGL 309 or CMI 309 or THTR 306 or consent of instructor.

**ENGL 481. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

Crosslisted with: W S 484

**ENGL 489. Cultural Studies: Literature and Theory****3 Credits**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable once under a different subtitle.

**ENGL 493. Middle English Textual Cultures****3 Credits**

Intensive study of cultures of reading, writing, and literary production in late-medieval England, situating Middle English literature in its manuscript contexts. No prior experience with Middle English required.

**ENGL 497. Internship****3-6 Credits (3-6)**

Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.

**ENGL 500. Supervised Study****1-3 Credits**

To prepare the student for the master's degree examinations by special studies in fields not covered in routine course work.

**Prerequisite:** consent of instructor.

**ENGL 501. Online Publishing****3 Credits**

This three-credit course provides a theoretical background for online publishing and design as well as hands-on experience publishing an online arts magazine. Taught with ENGL 430.

**ENGL 505. Graduate Study in Chaucer****3 Credits**

Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. May be repeated up to 3 credits.

**ENGL 508. Graduate Study in Shakespeare I****3 Credits**

Principal plays of Shakespeare's first two periods. Requirements include independent directed research.

**ENGL 509. Graduate Study in Shakespeare II****3 Credits**

Principal plays of Shakespeare's last two periods. Requirements include independent directed research.

**ENGL 510. Proseminar in Rhetoric and Professional Communication****3 Credits**

Introduction to research in rhetoric and professional communication. Taught with ENGL 610.

**ENGL 512. Graduate Study in Writing in the Workplace****3 Credits**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

**ENGL 513. Creative Writing Workshop: Fiction****3 Credits**

Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. May be repeated for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.

**ENGL 514. Creative Writing Workshop: Poetry****3 Credits**

Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.

**ENGL 516. Graduate Study in Approaches to Literature****3 Credits**

Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research.

**Prerequisite:** at least 6 credits in upper-division English courses.

**ENGL 517. Graduate Study in Critical Theory****3 Credits**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.

**ENGL 518. History of Rhetoric****3 Credits**

An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

**ENGL 519. Graduate Study in Modern Rhetorical Theory****3 Credits**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.

**ENGL 521. Graduate Study in a Literary Period or Movement****3 Credits**

Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 522. Graduate Study in a Literary Form or Genre****3 Credits**

Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 523. Graduate Study of a Major Author****3 Credits**

Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 524. Graduate Study in a Major Text****3 Credits**

Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 525. Graduate Study in Comparative Literature****3 Credits**

Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Repeatable under different subtitles.

**Prerequisite:** graduate standing or consent of instructor.

**ENGL 526. Special Topics in Critical Theory****3 Credits**

Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.

**ENGL 527. Graduate Study in Film and Digital Media****3 Credits**

Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.

**ENGL 529. British Romanticism****3 Credits**

Intensive study of major writers and critical topics from the Romantic period. Repeatable under different subtitles.

**ENGL 530. Argument Theory and Practice****3 Credits**

Examining theories of argument and how language convinces audiences to think and act in certain ways and not in others. Investigates argument across disciplines and in social/political contexts.

**ENGL 531. Technical Editing****3 Credits**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

**ENGL 532. Gothic Literature****3 Credits**

Intensive study of gothic literature in particular historical, aesthetic, cultural, or intellectual contexts, such as American Gothic, Female Gothic, Dark Romanticism, or Vampire Literature. Repeatable under different subtitles.

**ENGL 533. Victorian Literature****3 Credits**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

**ENGL 534. Graduate Study: Form and Technique in Fiction****3 Credits**

Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.

**ENGL 535. Graduate Study: Form and Technique in Poetry****3 Credits**

Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 12 credits.

**ENGL 536. The Borderlands Writing Project****3-6 Credits (3-6)**

Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536

**ENGL 538. Antebellum American Literature****3 Credits**

Intensive study of topics critical to the development of nineteenth century American literature before and during the Civil War, and the work of authors such as Emerson, Thoreau, Poe, Hawthorne, Melville, Whitman and Dickinson. Repeatable once under a different subtitle. May be repeated up to 6 credits.

**ENGL 542. Modern and Contemporary American Poetry****3 Credits**

Studies the development of American poetry from World War I to the present. Repeatable once under a different subtitle.

**ENGL 543. Multimedia Theory and Production****3 Credits**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.

**ENGL 544. Modern British Fiction****3 Credits**

Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable once under a different subtitle.

**ENGL 545. Postmodern Fiction****3 Credits**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable once under a different subtitle.

**ENGL 546. Advanced Creative Writing: Nonfiction Prose****3 Credits**

This graduate-level workshop will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 446 with additional work required at the graduate level. Consent of Instructor required. Crosslisted with: ENGL 446.

**ENGL 548. Graduate Study in Empirical Research****3 Credits**

Introduction to empirical research methods in composition, professional communication, and rhetoric.

**ENGL 549. Graduate Study in Writing****3 Credits**

Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.

**ENGL 550. Graduate Study in Literacy****3 Credits**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.

**ENGL 551. Practicum in the Grammar of American English****3 Credits**

Studies of formal grammar of the English language in preparation for the teaching of the English language and/or advanced linguistic analysis. Taught with ENGL 451.

**ENGL 552. Graduate Study in History of the English Language****3 Credits**

This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

**ENGL 553. World Literatures****3 Credits**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable once under a different subtitle.

**ENGL 555. Graduate Study in Rhetoric of Scientific Literature****3 Credits**

Intensive study of the rhetoric of selected works of scientific literature.

**ENGL 558. Latino/a Literature and Culture****3 Credits**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.

**ENGL 559. Black Literature and Culture in the United States****3 Credits**

Focuses on established and emergent Black U.S. literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.

**ENGL 560. Proposal and Grant Writing****3 Credits**

Developing proposals and grants in a workshop setting.

**ENGL 561. Topics in Writing Program Administration****3 Credits**

Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.

**ENGL 562. Interdisciplinary, Client-Based Project Practicum****3 Credits**

Hands-on experience in collaborating within interdisciplinary teams designing projects for organizational clients. Taught with ENGL 462.

**ENGL 563. Graduate Study in English Literature****3 Credits**

Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

**ENGL 564. History and Theory of Composition Studies****3 Credits**

Studies in the history and theory of composition as a discipline. Taught with ENGL 664.

**ENGL 565. Intercultural Rhetoric and Professional Communication****3 Credits**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.

**ENGL 567. Documentary Film Theory and Criticism****3 Credits (3+3P)**

Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

**ENGL 568. Rhetoric and Cultural Studies****3 Credits**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.

**ENGL 569. Graduate in American Literature****3 Credits**

A group of works from a particular period of American literary history. Repeatable under different subtitles.

**ENGL 570. Graduate Study in Approaches to Composition****3 Credits**

Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.

**ENGL 571. Composition Pedagogy and Practicum****3 Credits**

Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.

**ENGL 572. Technical-Professional Communication: Theory and Pedagogy****3 Credits**

Topics in teaching business, technical and scientific communication in academic and workplace contexts.

**Prerequisite:** graduate standing.

**ENGL 574. Workshop: Advanced Writing Prose****3 Credits**

Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

**ENGL 575. Workshop: Advanced Writing Poetry****3 Credits**

Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

**ENGL 576. Workshop: Advanced Writing Playwriting****3 Credits**

Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.

**ENGL 577. Workshop: Advanced Technical and Professional Writing****3 Credits**

Intensive practice in technical and professional writing and editing in a workshop environment. May be repeated for a total of 6 credits. Consent of instructor required.

**ENGL 578. Topics in Rhetoric and Technology****3 Credits**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.

**ENGL 579. Computers and Writing****3 Credits**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

**ENGL 580. Graduate Problems in Creative Writing****3 Credits**

Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.

**ENGL 581. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

Crosslisted with: W S 584

**ENGL 582. Gender and Popular Culture****3 Credits**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: W S 582

**ENGL 583. Critical Writing Studies****3 Credits**

Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.

**ENGL 584. Workshop: Advanced Academic Writing for International Students****3 Credits**

This workshop-based course is for graduate-level multilingual writers from all disciplines who want to improve their English academic writing in an intensive and collaborative environment. Students will propose a major writing project to workshop throughout the semester, such as dissertation, thesis, comprehensive exams, etc. Some of the topics covered will be academic language, cohesion/coherence, organization, and supporting academic arguments. Other topics to be determined by needs of the class. ) 4.Consent of instructor.

**Prerequisite(s):** 1.Be classified as a graduate student by the Graduate School 2.Be classified as an international student whose first language is not English 3.Have a major writing project in progress (comprehensive exams, thesis, dissertation, conference paper, etc.

**ENGL 585. Advanced Writing Workshop: RPC Capstone****3 Credits**

Students work to develop and revise their chosen Master's program Capstone Project (a portfolio, thesis or master essay) in consultation with instructor and classmates. Students provide and receive feedback on their work-in-progress. Consent of Instructor required.

**ENGL 589. Cultural Studies: Literature and Theory****3 Credits**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable once under a different subtitle.

**ENGL 590. Master's Seminar in Rhetoric****3 Credits**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.

**ENGL 591. Graduate Screenwriting****3 Credits**

Students will prepare a feature-length screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Aimed at preparing writers for the professional market. Consent of instructor required.

**ENGL 595. Master's Workshop: Poetry****3-6 Credits (3-6)**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

**Prerequisite(s):** Enrolled in MFA penultimate semester.

**ENGL 596. Master's Workshop: Fiction****3-6 Credits**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

**Prerequisite(s):** Enrolled in MFA penultimate semester.

**ENGL 597. Internship in Technical and Professional Communication****3-6 Credits (3-6)**

Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.

**ENGL 598. Master's Essay****3 Credits**

Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.

**ENGL 599. Master's Thesis****1-15 Credits**

Thesis.

**ENGL 600. Doctoral Research****1-15 Credits**

Assigns credit for research performed prior to the doctoral comprehensive examination.

**ENGL 601. Qualitative Research****3 Credits**

Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.

**ENGL 602. Quantitative Research****3 Credits**

Theory and practice of designing quantitative research studies and of collecting and analyzing data. Emphasis on quantitative methods of research in composition, professional communication, and rhetoric.

**ENGL 603. Rhetorical Criticism and Methodology****3 Credits**

Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on methods of rhetorical criticism.

**ENGL 604. Digital Research Methods****3 Credits**

This course will serve as one of the core methods courses in the RPC PhD program, focusing on "digital" methods in rhetorical studies. As such, the aim of this class is to help you begin to gain confidence in conducting research in rhetoric, professional communication, and composition using digital methods. In this course we will assume that digital methods in rhetoric take broadly two forms: first, digital methods of acquisition, processing, and presentation of research data. And second, digital methods of production and circulation of rhetorical objects. The former closely resembles the methods of "digital humanities" while the latter will be closer to media archaeology and "critical making" practices. In all cases, we will relate these tools and methods to key questions and theories in our field, asking how and why we might apply digital methods in rhetorical scholarship.

**Prerequisite(s):** graduate standing.

**ENGL 610. Proseminar in Rhetoric and Professional Communication****3 Credits**

Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.

**ENGL 643. Multimedia Theory and Production****3 Credits**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.

**ENGL 646. Teaching Rhetoric and Writing with English Language Learners****3 Credits**

This course introduces students to the rich interdisciplinary world of writing for English language learners with the goal of helping researchers and instructors understand the unique characteristics and needs of ELL writers. It also examines Generation 1.5, bilingualism, and Spanish-dominant writers along the U.S.-Mexico Border. The course prepares students to work with ELL writing in curriculum design, needs analysis, classroom implementation, assessment, writing program administration, and institutional policies. The course will be a requirement for those GAs seeking to teach experimental sections of first-year multilingual composition at NMSU.

**Prerequisite(s):** graduate standing.

**ENGL 649. Graduate Study in Writing****3 Credits**

Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.

**ENGL 650. Graduate Study in Literacy****3 Credits**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.

**ENGL 661. Topics in Writing Program Administration****3 Credits**

Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.

**ENGL 664. History and Theory of Composition Studies****3 Credits**

Studies in the history and theory of composition as a discipline. Taught with ENGL 564.

**ENGL 665. Intercultural Rhetoric and Professional Communication****3 Credits**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.

**ENGL 668. Rhetoric and Cultural Studies****3 Credits**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.

**ENGL 678. Topics in Rhetoric and Technology****3 Credits**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.

**ENGL 683. Critical Writing Studies****3 Credits**

This course investigates the field of Writing Studies as a distinct field of study, related to but not synonymous with Composition Studies. While debates surrounding the relationships among Writing Studies and Composition Studies flourish, this course centers on the former—investigating writing as a practice, process, and object that merits attention in its own right. Such attention will be grounded in contemporary critical and cultural theory that contests writing as a positive or neutral sign (i.e. activity theory, posthumanism, ecocriticism, new materialism, new media studies; feminist, queer, critical race or decolonial theory). Crosslisted with: ENGL 583.

**Prerequisite(s):** graduate standing.

**ENGL 690. Doctoral Seminar in Rhetoric****3 Credits**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.

**ENGL 700. Doctoral Dissertation****15 Credits**

Dissertation.

**Phone:** (575) 646-3931

**Website:** <http://www.nmsu.edu/~english/>

## English - Bachelor of Arts

## Concentration: Creative Writing

### Departmental Requirements

In addition to meeting the English basic skills requirement, the student majoring in Creative Writing must complete 42 credits in English beyond ENGL 111G Rhetoric and Composition satisfying the following requirements.

**Departmental Requirements**

Select three from the following: <sup>1,2</sup>		9
ENGL 243	The Bible as Literature	
ENGL 251	Survey of American Literature I	
ENGL 252	Survey of American Literature II	
ENGL 263	History of Argument	
ENGL 271	Survey of English Literature I	
ENGL 272	Survey of English Literature II	
ENGL 310	Critical Writing <sup>2</sup>	3
Select one from the following: <sup>2</sup>		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Select a minimum of two different Creative Writing workshops from the following:		6
ENGL 304	Creative Writing: Prose	
ENGL 306	Creative Writing: Poetry	
ENGL 307	Creative Writing: Creative Nonfiction	
ENGL 308	Creative Writing: Playwriting	
ENGL 309	Screenwriting I	
Select two advanced Creative Writing Workshops from the following:		6
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
ENGL 415	Advanced Creative Writing: playwriting Workshop	
ENGL 480	Screenwriting II	
Select two from the following:		6
ENGL 354	Form and Technique in Fiction	
ENGL 356	Form and Technique in Poetry	
ENGL 358	Form and Technique in Playwriting	
Select 9 additional credits from English courses numbered 400-499.		9
<b>Second Language Requirement: (required- see the section at the bottom of the page)</b>		
Total Credits		42

## Concentration: English

### Departmental Requirements

In addition to meeting the English basic skills requirement, the student majoring in English must complete 42 credits in English

beyond ENGL 111G Rhetoric and Composition satisfying the following requirements.

#### Departmental Requirements

Select four from the following: <sup>1,2</sup>	12
ENGL 220G Introduction to Creative Writing	
ENGL 243 The Bible as Literature	
ENGL 251 Survey of American Literature I	
ENGL 252 Survey of American Literature II	
ENGL 263 History of Argument	
ENGL 271 Survey of English Literature I	
ENGL 272 Survey of English Literature II	
ENGL 310 Critical Writing <sup>2</sup>	3
Select one from the following: <sup>2</sup>	3
ENGL 301 Theory and Criticism: Rhetoric and Culture	
ENGL 302 Theory and Criticism: Literature and Culture	
ENGL 303 Theory and Criticism: Film, Media and Culture	
Select 6 additional credits from English courses numbered 298-399.	6
Students may count 1 or 2 of the following Honors courses towards the requirement of 6 hours of 300-level electives:	
HON 348V Comparative Mythology: Myth, Ritual, and the Life Cycle <sup>3</sup>	
HON 365V African and Caribbean: Literature and Film	
HON 366V The Gothic Imagination	
HON 379V Literature as Film	
Select one from the following:	3
ENGL 469 Advanced Study in American Literature	
ENGL 438 Literature of the American Renaissance	
ENGL 442 Modern and Contemporary American Poetry	
ENGL 458 Latino/a Literature and Culture	
ENGL 405 Chaucer	3
or ENGL 407 Milton	
ENGL 408 Shakespeare I	3
or ENGL 409 Shakespeare II	
Select 9 additional credits from English courses numbered 400-499.	9
<b>Second Language Requirement: (required- see the section at the bottom of the page)</b>	
<b>Total Credits</b>	<b>42</b>

<sup>1</sup> Students may make 1 or 2 of the following substitutions:

- HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
- HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;

<sup>2</sup> These 15 credits should be completed before the student enrolls in 400-level courses.

<sup>3</sup> Students may not take both ENGL 392V Mythology and HON 348V Comparative Mythology: Myth, Ritual, and the Life Cycle.

## Concentration: Literature, Language and Culture

### Departmental Requirements

In addition to meeting the English basic skills requirement, the student pursuing an emphasis in Literature, Language, and Culture must complete 42 credits in English beyond ENGL 111G Rhetoric and Composition satisfying the following requirements.

#### Departmental Requirements

Select three from the following: <sup>1,2</sup>	9
ENGL 251 Survey of American Literature I	
ENGL 252 Survey of American Literature II	
ENGL 271 Survey of English Literature I	
ENGL 272 Survey of English Literature II	
Select one from the following: <sup>1,2</sup>	3
ENGL 220G Introduction to Creative Writing	
ENGL 243 The Bible as Literature	
ENGL 263 History of Argument	
ENGL 310 Critical Writing <sup>2</sup>	3
Select one from the following: <sup>2</sup>	3
ENGL 301 Theory and Criticism: Rhetoric and Culture	
ENGL 302 Theory and Criticism: Literature and Culture (recommended)	
ENGL 303 Theory and Criticism: Film, Media and Culture	
Select 6 additional credits from English courses numbered 298-399. <sup>3</sup>	6
Students may count 1 or 2 of the following Honors courses towards the requirement of 6 hours of 300-level electives: <sup>3</sup>	
HON 348V Comparative Mythology: Myth, Ritual, and the Life Cycle	
HON 365V African and Caribbean: Literature and Film	
HON 366V The Gothic Imagination	
HON 379V Literature as Film	
Select one from the following:	3
ENGL 321V Modern European Drama	
ENGL 323 American Drama	
ENGL 326 Cultural Identity and Representation Across the Media	
ENGL 327V Shakespeare around the Globe	
ENGL 328V Literature of Science Fiction and Fantasy	
ENGL 329 Studies in Drama	
ENGL 330V Studies in Poetry	
ENGL 335V Studies in the Novel	
ENGL 336 Studies in Film	
ENGL 339V Chicana/o Literature	
ENGL 341V American Indian Literature	
ENGL 349 The Short Story	
ENGL 363 Literature for Children and Young Adults	

ENGL 380V	Women Writers	
ENGL 392V	Mythology	
ENGL 394V	Southwestern Literature	
ENGL 399	Special Topics (with advisor approval)	
Select one from the following:		3
ENGL 469	Advanced Study in American Literature	
ENGL 438	Literature of the American Renaissance	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 405	Chaucer	3
or ENGL 407	Milton	
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
Select 6 additional credits from English courses numbered 400-499. <sup>4</sup>		6
Select 3 credits from the following:		3
ENGL 400	Independent Study: Upper Division (with advisor approval)	
ENGL 405	Chaucer	
ENGL 407	Milton	
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
ENGL 417	Advanced Study in Critical Theory	
ENGL 421	Advanced Study in a Literary Period or Movement	
ENGL 422	Advanced Study in a Literary Form or Genre	
ENGL 423	Advanced Study in a Major Author	
ENGL 424	Advanced Study in a Major Text	
ENGL 425	Advanced Study in Comparative Literature	
ENGL 429	British Romanticism	
ENGL 432	Gothic Literature	
ENGL 433	Victorian Literature	
ENGL 438	Literature of the American Renaissance	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 444	Modern British Fiction	
ENGL 445	Postmodern Fiction	
ENGL 451	Practicum in the Grammar of American English	
ENGL 452	History of the English Language	
ENGL 453	World Literatures	
ENGL 458	Latino/a Literature and Culture	
ENGL 463	Advanced Study in English Literature	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 489	Cultural Studies: Literature and Theory	
ENGL 493	Middle English Textual Cultures	
<b>Second Language Requirement: (required- see the section at the bottom of the page)</b>		

Total Credits 45

- <sup>1</sup> Students may make 1 or 2 of the following substitutions:
  - HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
  - HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;
- <sup>2</sup> These 18 credits should be completed before the student enrolls in 400 level courses.
- <sup>3</sup> Three of these credits may come from any of the 300-level English department courses. Students may not take both ENGL 392V Mythology and HON 348V Comparative Mythology: Myth, Ritual, and the Life Cycle.
- <sup>4</sup> Three of these credits may come from any of the 400-level English department courses.

## Concentration: Rhetoric, Digital Media and Professional Communication

### Departmental Requirements

In addition to meeting the English basic skills requirement, the student pursuing a concentration in Rhetoric, Digital Media, and Professional Communication must complete 42 credits in English beyond ENGL 111G Rhetoric and Composition satisfying the following requirements.

#### Departmental Requirements

Select four from the following:<sup>1,2</sup> 12

ENGL 220G	Introduction to Creative Writing	
ENGL 243	The Bible as Literature	
ENGL 251	Survey of American Literature I	
ENGL 252	Survey of American Literature II	
ENGL 263	History of Argument	
ENGL 271	Survey of English Literature I	
ENGL 272	Survey of English Literature II	
ENGL 310	Critical Writing <sup>2</sup>	3

Select one from the following:<sup>2</sup> 3

ENGL 301	Theory and Criticism: Rhetoric and Culture (recommended)	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture (recommended)	

#### Rhetoric and Composition

Select two from the following:<sup>3</sup> 6

ENGL 418	History of Rhetoric	
ENGL 419	Modern Rhetorical Theory	
ENGL 449	Advanced Study in Writing	
ENGL 451	Practicum in the Grammar of American English	
ENGL 452	History of the English Language	
ENGL 470	Approaches to Composition	

#### Professional Communication

Select two from the following:<sup>3</sup> 6

ENGL 318G	Advanced Technical and Professional Communication	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	

ENGL 449	Advanced Study in Writing	
ENGL 460	Proposal Writing	
ENGL 462	Interdisciplinary, Client-Based Project Practicum	
ENGL 497	Internship	
<i>Digital Rhetoric and Design</i>		
Select two from the following: <sup>3</sup>		6
ENGL 315	Writing for the Web	
ENGL 326	Cultural Identity and Representation Across the Media	
ENGL 449	Advanced Study in Writing	
ENGL 478	Document Design	
<b>Additional Courses</b>		
Select 6 credits of upper division level, advisor-approved English courses relevant to program of study. <sup>4</sup>		6
<b>Second Language Requirement: (required- see the section at the bottom of the page)</b>		
Total Credits		42

- <sup>1</sup> Students may make 1 or 2 of the following substitutions:
- HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
  - HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;

- <sup>2</sup> These 18 credits should be completed before the student enrolls in 400 level courses.

- <sup>3</sup> Students must take a total of 12 credit hours at the 400 level or above.

## Second Language Requirement

For the Bachelor of Arts in the English, for all concentrations, there is a one year second language requirement, the student must do one of the following:

### Option 1:

Complete two semesters from the following:

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	
<i>For Heritage Learners:</i>		
SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

### Option 3:

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	
<i>OR</i>		

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Creative Writing - Undergraduate Minor

Students not earning a bachelor's degree in English with an emphasis in Creative Writing are eligible to pursue a minor in Creative Writing. Students must earn 18 credits from the approved course lists below. At least 12 credits must be upper division. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a BA in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Creative Writing.

### Requirements

Select two from the following: <sup>1</sup>		6
ENGL 220G	Introduction to Creative Writing	
ENGL 243	The Bible as Literature	
ENGL 251	Survey of American Literature I	
ENGL 252	Survey of American Literature II	
ENGL 263	History of Argument	

ENGL 271	Survey of English Literature I	
ENGL 272	Survey of English Literature II	
Select two from the following: <sup>2</sup>		6
ENGL 304	Creative Writing: Prose	
ENGL 306	Creative Writing: Poetry	
ENGL 307	Creative Writing: Creative Nonfiction	
ENGL 308	Creative Writing: Playwriting	
ENGL 309	Screenwriting I	
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
ENGL 415	Advanced Creative Writing: playwriting Workshop	
ENGL 480	Screenwriting II	
Select one from the following: <sup>2</sup>		3
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
ENGL 415	Advanced Creative Writing: playwriting Workshop	
ENGL 480	Screenwriting II	
Select 3 credits from English literature courses numbered 300 and above.		3
<b>Total Credits</b>		<b>18</b>

<sup>1</sup> Students may make 1 or 2 of the following substitutions:

- HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
- HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;

<sup>2</sup> All Creative Writing workshops may be taken more than once.

## English - Undergraduate Minor

Students not earning a bachelor's degree in English are eligible to pursue a minor in English. Students must earn 18 credits from the approved course lists below. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English.

### Requirements

Select 6 credits from the following: <sup>1</sup>		6
ENGL 220G	Introduction to Creative Writing	
ENGL 243	The Bible as Literature	
ENGL 251	Survey of American Literature I	
ENGL 252	Survey of American Literature II	
ENGL 263	History of Argument	
ENGL 271	Survey of English Literature I	
ENGL 272	Survey of English Literature II	
Select one from the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	

ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 310	Critical Writing	
ENGL 311G	Advanced Composition	
Select 6 credits from English courses numbered 300-499.		6
Select three additional credits from English courses numbered 400-499.		3
<b>Total Credits</b>		<b>18</b>

<sup>1</sup> Students may make 1 or 2 of the following substitutions:

- HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
- HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;

## Literature - Undergraduate Minor

Students not earning a bachelor's degree in English with a concentration in Literature, Language and Culture are eligible to pursue a minor in Literature. Students must earn 18 credits from the approved course lists below. At least 12 credits must be upper division. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a BA in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Literature.

### Requirements

Select two from the following: <sup>1</sup>		6
ENGL 243	The Bible as Literature	
ENGL 251	Survey of American Literature I	
ENGL 252	Survey of American Literature II	
ENGL 263	History of Argument	
ENGL 271	Survey of English Literature I	
ENGL 272	Survey of English Literature II	
Select one from the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture (recommended)	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 310	Critical Writing	
Select one from the following:		3
ENGL 321V	Modern European Drama	
ENGL 323	American Drama	
ENGL 326	Cultural Identity and Representation Across the Media	
ENGL 327V	Shakespeare around the Globe	
ENGL 328V	Literature of Science Fiction and Fantasy	
ENGL 329	Studies in Drama	
ENGL 330V	Studies in Poetry	
ENGL 335V	Studies in the Novel	
ENGL 336	Studies in Film	

ENGL 339V	Chicana/o Literature
ENGL 341V	American Indian Literature
ENGL 349	The Short Story
ENGL 363	Literature for Children and Young Adults
ENGL 380V	Women Writers
ENGL 392V	Mythology
ENGL 394V	Southwestern Literature
ENGL 399	Special Topics (with advisor approval)
<b>Substitutions Allowed</b>	
HON 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle
HON 365V	African and Caribbean: Literature and Film
HON 366V	The Gothic Imagination
Select two from the following: 6	
ENGL 405	Chaucer
ENGL 407	Milton
ENGL 408	Shakespeare I
ENGL 409	Shakespeare II
ENGL 417	Advanced Study in Critical Theory
ENGL 421	Advanced Study in a Literary Period or Movement
ENGL 422	Advanced Study in a Literary Form or Genre
ENGL 423	Advanced Study in a Major Author
ENGL 424	Advanced Study in a Major Text
ENGL 425	Advanced Study in Comparative Literature
ENGL 429	British Romanticism
ENGL 432	Gothic Literature
ENGL 433	Victorian Literature
ENGL 438	Literature of the American Renaissance
ENGL 442	Modern and Contemporary American Poetry
ENGL 444	Modern British Fiction
ENGL 445	Postmodern Fiction
ENGL 451	Practicum in the Grammar of American English
ENGL 452	History of the English Language
ENGL 453	World Literatures
ENGL 458	Latino/a Literature and Culture
ENGL 463	Advanced Study in English Literature
ENGL 469	Advanced Study in American Literature
ENGL 481	Women's Literature
ENGL 489	Cultural Studies: Literature and Theory
ENGL 493	Middle English Textual Cultures
Total Credits 18	

<sup>1</sup> Students may make 1 or 2 of the following substitutions:

- HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
- HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;

## Medieval and Early Modern Studies - Undergraduate Minor

Students must earn 18 credits from the approved course lists below. At least 9 credits must be upper division. No more than 9 credits may be taken under faculty in any department. Students may request approval for other courses clearly related to Medieval and/or Early Modern Studies from the undergraduate advisor in the Department of English in consultation with faculty in medieval and early modern studies.

### Requirements

Select three from the following: 9	
ART 295G	Introduction to Art History I
ENGL 243	The Bible as Literature
ENGL 271	Survey of English Literature I
HIST 101G	Roots of Modern Europe
HIST 211G	East Asia to 1600
HIST 221G	Islamic Civilizations to 1800
HON 222G	Foundations of Western Culture
HON 229G	The New Testament as Literature
HON 234G	The Worlds of Arthur
HON 239G	Medieval Understandings: Literature and Culture in the Middle Ages
Select 9 credits from the following: 9	
ART 300	Special Topics in Art History <sup>1</sup>
ART 328	Baroque Art and Architecture in Northern Europe
ART 333	Baroque Art and Architecture in Italy, Spain, and Hispanic Latin America
ART 477	Independent Research Problems in Art History <sup>1</sup>
ART 478	Seminar: Selected Topics in Art History <sup>1</sup>
ENGL 380V	Women Writers <sup>1</sup>
ENGL 392V	Mythology
ENGL 405	Chaucer
ENGL 407	Milton
ENGL 408	Shakespeare I
ENGL 409	Shakespeare II
ENGL 421	Advanced Study in a Literary Period or Movement <sup>1</sup>
ENGL 422	Advanced Study in a Literary Form or Genre <sup>1</sup>
ENGL 423	Advanced Study in a Major Author <sup>1</sup>
ENGL 424	Advanced Study in a Major Text <sup>1</sup>
ENGL 425	Advanced Study in Comparative Literature <sup>1</sup>
ENGL 452	History of the English Language
ENGL 463	Advanced Study in English Literature
ENGL 481	Women's Literature <sup>1</sup>
W S 484	Women's Literature <sup>1</sup>
ENGL 493	Middle English Textual Cultures
FREN 381	Survey of French Literature I
FREN 451	Special Topics in French <sup>1</sup>
HIST 311V	Colonial Latin America

HIST 323	Cultural History of Later Imperial China
HIST 372	The Roman World
HIST 383	Germany
HIST 387	Spain
HIST 392	Tudor-Stuart England, 1485-1715
HIST 400	Special Topics <sup>1</sup>
HIST 433	United States Labor History Since 1877
HIST 434	Urban History
HIST 471	China through the Ming Dynasty
HON 326V	Art and Mythology
HON 400	Honors Thesis <sup>1</sup>
MUS 302	Music History and Literature: Classic through Romantic
MUS 421	Music of the Baroque Era
PHIL 344	Modern Philosophy
PHIL 363	Independent Studies <sup>1</sup>
PHIL 463	Independent Studies <sup>1</sup>
SPAN 306	Special Topics <sup>1</sup>
THTR 312	Acting Shakespeare
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Total Credits	18

<sup>1</sup> Courses are approved for the minor only when their topics are appropriate. Students must seek approval to count these courses for the minor from the undergraduate advisor in the Department of English.

## Rhetoric and Professional Communication - Undergraduate Minor

Students not earning a bachelor's degree in English with a concentration in Rhetoric, Digital Media, and Professional Communication are eligible to pursue a minor in Rhetoric and Professional Communication. Students must earn 18 credits from the approved course lists below. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a BA in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Rhetoric and Professional Communication.

### Requirements

Select one from the following: <sup>1</sup>	3
ENGL 220G	Introduction to Creative Writing
ENGL 243	The Bible as Literature
ENGL 251	Survey of American Literature I
ENGL 252	Survey of American Literature II
ENGL 263	History of Argument
ENGL 271	Survey of English Literature I
ENGL 272	Survey of English Literature II
Select one from the following:	3
ENGL 203G	Business and Professional Communication
ENGL 211G	Writing in the Humanities and Social Sciences
ENGL 218G	Technical and Scientific Communication

ENGL 311G	Advanced Composition
ENGL 318G	Advanced Technical and Professional Communication
Select 12 credits from the following:	12
ENGL 301	Theory and Criticism: Rhetoric and Culture
ENGL 315	Writing for the Web
ENGL 318G	Advanced Technical and Professional Communication
ENGL 326	Cultural Identity and Representation Across the Media
ENGL 412	Writing in the Workplace
ENGL 418	History of Rhetoric
ENGL 431	Technical Editing
ENGL 449	Advanced Study in Writing
ENGL 451	Practicum in the Grammar of American English
ENGL 452	History of the English Language
ENGL 460	Proposal Writing
ENGL 462	Interdisciplinary, Client-Based Project Practicum
ENGL 470	Approaches to Composition
ENGL 478	Document Design
ENGL 497	Internship
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Total Credits	18

<sup>1</sup> Students may make 1 or 2 of the following substitutions:

- HON 229G The New Testament as Literature for ENGL 243 The Bible as Literature;
- HON 234G The Worlds of Arthur, or HON 239G Medieval Understandings: Literature and Culture in the Middle Ages for ENGL 271 Survey of English Literature I;

## English - Master of Arts

New Mexico State University offers MA programs in four areas of emphasis; each one requires 36 hours of graduate-level work.

### Concentration: Creative Writing

Students electing this concentration:

- complete 36 hours of graduate-level course work including creative writing and literature;
- submit a creative writing portfolio (totaling 20-50 pages), depending on genre choices, that includes original creative work in more than one genre and either an essay describing the writer's personal poetics or a critical piece of writing relevant to the portfolio; and
- pass an oral examination.

### Required Coursework<sup>1</sup>

Workshop courses in at least two genres	12	
Graduate form and technique courses	6	
Graduate literature courses in the Department of English	9	
Elective courses	6	
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In the final term:		
ENGL 574	Workshop: Advanced Writing Prose	3
ENGL 575	Workshop: Advanced Writing Poetry	3

ENGL 576	Workshop: Advanced Writing Playwriting	3
ENGL 591	Graduate Screenwriting	3
Total Credits		45

<sup>1</sup> Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

## Concentration: English Studies for Teachers

Students take 36 hours of graduate coursework, including core courses in creative writing, film, literature and rhetoric and professional communication, as well as additional courses in an area of specialization approved by an advisor. Students in the program develop individualized plans of study in consultation with an advisor. They conclude their program by developing a master's portfolio or other approved capstone project and passing an oral examination. This portfolio may provide material for public schools' Professional Development Dossier. With advisor approval, students may take up to two related courses (six credit hours) in other departments, such as Communication Studies, Education, Journalism, and Theatre, and may also develop an alternative capstone experience and enroll for appropriate credits (such as independent study).

### Required Coursework

Core class in Composition, Rhetoric, and Professional Communication	3
Core class in Creative Writing	3
Core class in Literature	3
Core class in Film	3
Courses in core area of specialization	18-21
Courses typically meeting capstone requirement:	3-6
ENGL 577 Workshop: Advanced Technical and Professional Writing	
Or Portfolio	
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Total Credits	33-39

## Concentration: Literature

Students electing this concentration can choose to work in various areas of literature, criticism and film. Students are required to

- complete 36 hours of coursework while satisfying area requirements (in early and modern literatures, in British and American Literatures, and in critical theory) with advisor-approved courses;
- demonstrate competency in a foreign language;
- deliver a public presentation on their research;
- write a master essay or thesis; and
- complete their program by passing an oral examination.

See advisor for list of courses satisfying theory and distribution requirements.

### Required Coursework <sup>1</sup>

Graduate course in critical theory	3
Literature courses, including "early" and "late" periods, English and American	18
Elective courses in English Department	9-12

### Master's Thesis or Master Essay

ENGL 599	Master's Thesis <sup>2</sup>	3-6
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or ENGL 598	Master's Essay	
Total Credits		33-39

<sup>1</sup> Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

<sup>2</sup> Students must take 6 credits of ENGL 599 Master's Thesis to complete this requirement.

## Concentration: Rhetoric and Professional Communication

Students electing this concentration take core courses across a wide range of topics within rhetoric and professional communication and choose from one of four areas of specialization:

- Composition,
- Critical/Cultural Studies,
- Rhetoric and
- Professional and Technical Communication.

Students conclude their program by writing a thesis, composing a portfolio of work completed in the program, or writing a master essay and by passing an oral examination. Students develop individualized plans of study in consultation with an advisor.

### Required Coursework

Core classes from an area of specialization:	6
Composition	
Critical/Cultural Studies	
Rhetoric	
Professional and Technical Communication	
Core classes in additional area(s)	6
Additional courses in area of specialization	12

### Methods Course

Select one from the following:	3
ENGL 548	Graduate Study in Empirical Research
ENGL 601	Qualitative Research
ENGL 602	Quantitative Research
ENGL 603	Rhetorical Criticism and Methodology

### Elective Courses

Select one from the following:	
Advisor-approved electives in English and/or related fields	
ENGL 597	Internship in Technical and Professional Communication
ENGL 599	Master's Thesis <sup>1</sup>

### Capstone Course

Select one from the following: <sup>2</sup>	3-6
ENGL 585	Advanced Writing Workshop: RPC Capstone
ENGL 598	Master's Essay
ENGL 599	Master's Thesis <sup>1</sup>

### Core Courses

Select two core courses from area of specialization.	6
Select two core courses from any of the other three core areas:	6

### Core Composition Courses

ENGL 564	History and Theory of Composition Studies	
ENGL 570	Graduate Study in Approaches to Composition <sup>3</sup>	
ENGL 571	Composition Pedagogy and Practicum <sup>3</sup>	
<i>Core Critical/Cultural Studies Courses</i>		
ENGL 517	Graduate Study in Critical Theory	
ENGL 568	Rhetoric and Cultural Studies	
<i>Core Professional and Technical Communication Courses</i>		
ENGL 512	Graduate Study in Writing in the Workplace	
ENGL 572	Technical-Professional Communication: Theory and Pedagogy	
<i>Core Rhetoric Courses</i>		
ENGL 518	History of Rhetoric	
ENGL 519	Graduate Study in Modern Rhetorical Theory	
<b>Specialized Courses</b>		
Select four additional courses in area of specialization determined in consultation with an advisor. <sup>4</sup>		12
<i>Composition Courses</i>		
ENGL 549	Graduate Study in Writing	
ENGL 550	Graduate Study in Literacy	
ENGL 561	Topics in Writing Program Administration	
<i>Critical/Cultural Studies Courses</i>		
ENGL 549	Graduate Study in Writing	
ENGL 550	Graduate Study in Literacy	
ENGL 555	Graduate Study in Rhetoric of Scientific Literature	
ENGL 590	Master's Seminar in Rhetoric	
<i>Professional and Technical Communication Courses</i>		
ENGL 451	Practicum in the Grammar of American English	
ENGL 478	Document Design	
ENGL 543	Multimedia Theory and Production	
ENGL 549	Graduate Study in Writing	
ENGL 562	Interdisciplinary, Client-Based Project Practicum	
ENGL 565	Intercultural Rhetoric and Professional Communication	
ENGL 577	Workshop: Advanced Technical and Professional Writing	
ENGL 578	Topics in Rhetoric and Technology	
<i>Rhetoric Courses</i>		
ENGL 530	Argument Theory and Practice	
ENGL 549	Graduate Study in Writing	
ENGL 555	Graduate Study in Rhetoric of Scientific Literature	
ENGL 590	Master's Seminar in Rhetoric	
<b>Total Credits</b>		<b>54-57</b>

<sup>1</sup> Students must take 6 credits of ENGL 599 Master's Thesis to complete this requirement. ENGL 599 Master's Thesis: in lieu of portfolio or master essay.

- <sup>2</sup> Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.
- <sup>3</sup> Students may take either ENGL 570 Graduate Study in Approaches to Composition or ENGL 571 Composition Pedagogy and Practicum as a core course. Taking a second course will count under the area of specialization.
- <sup>4</sup> Students are encouraged to take ENGL 510 Proseminar in Rhetoric and Professional Communication, early in their time as a graduate student. This course is appropriate for all areas of specialization. Appropriate courses for each specialization are suggested, though the lists are not inclusive of all options.

## Creative Writing - Master of Fine Arts in Creative Writing

Students pursuing the MFA in Creative Writing devote themselves to concentrated study and development of a chosen genre: poetry or fiction. Students

- complete 54 hours of graduate-level coursework,
- present a book-length thesis of original work with an introduction or afterward,
- perform a public reading from the thesis, and
- pass an oral examination in the final semester.

A maximum of 12 credits in Form and Technique count for the degree.

### Required Coursework<sup>1</sup>

MFA workshop in the major genre (poetry, fiction)	12
Form and Technique courses in major genre	6
Workshop in a second genre	3
Master Workshop (poetry, fiction)	6-12
Graduate literature courses (may include 2 Form & Technique)	12
ENGL 599 Master's Thesis	1-15
Elective Courses	3-12
<b>Total Credits</b>	<b>43-72</b>

<sup>1</sup> Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

## Rhetoric and Professional Communication - Doctor of Philosophy

Students in the doctoral program will develop individualized plans of study in consultation with advisors. Students are required to take

- 78 hours of graduate-level coursework including the doctoral proseminar in the first semester;
- courses in research methods;
- core courses in composition, critical/cultural studies, professional communication, and rhetoric;
- additional coursework in an area of specialization determined in consultation with an advisor;
- an internship; and
- a dissertation.

The Ph.D. also requires a qualifying portfolio, a comprehensive examination and an oral examination. The dissertation must be completed and approved within 5 years after the comprehensive exam. Consult the department for additional instructions regarding the internship, qualifying comprehensive examinations, portfolio and dissertation.

## Requirements

### Program Requirements

ENGL 610	Proseminar in Rhetoric and Professional Communication	3
Methods Courses		6
ENGL 597	Internship in Technical and Professional Communication	6
ENGL 700	Doctoral Dissertation	18
Select one from the following: <sup>1</sup>		3
ENGL 548	Graduate Study in Empirical Research	
ENGL 601	Qualitative Research	
ENGL 602	Quantitative Research	
ENGL 603	Rhetorical Criticism and Methodology	

### Core Courses

Select four from the following core courses: 12

#### Core Composition Courses

ENGL 664	History and Theory of Composition Studies	
ENGL 571	Composition Pedagogy and Practicum	

#### Core Critical/Cultural Studies Courses

ENGL 517	Graduate Study in Critical Theory	
ENGL 668	Rhetoric and Cultural Studies	

#### Core Professional and Technical Communication Courses

ENGL 512	Graduate Study in Writing in the Workplace	
ENGL 572	Technical-Professional Communication: Theory and Pedagogy	

#### Core Rhetoric Courses

ENGL 518	History of Rhetoric	
ENGL 519	Graduate Study in Modern Rhetorical Theory	

### Specialized Courses

Select 15-18 credits in area of specialized determined in consultation with an advisor. <sup>2</sup>	15-18
Total Credits	63-66

<sup>1</sup> Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

<sup>2</sup> Students define their specialized area, a coherent set of related courses drawn from both inside and outside the Department of English, in consultation with their doctoral committee. Possible specializations include Border Rhetorics and Cultures; Writing Program Administration/Writing Center Administration; Assessment; Pedagogy; Literacy Studies; Identity and Political and Social Rhetoric; New Media Rhetoric and Design; Intercultural Rhetorics; Writing Across the Curriculum; Workplace Communication; and the Rhetoric of Science.

## Transfer Courses (up to 18 credits)

Students may apply 18 hours of master's level work to the 54-hour coursework requirement with departmental approval. In consultation with an advisor and the Doctoral Committee, students petition for transfer credits when they submit their qualifying portfolio and file the program of study with the Graduate School.

## Financial Support

Students are eligible for teaching assistantships and a variety of positions that involve writing around campus and the community. Because many students work full time, many courses are offered in the late afternoon and evening to accommodate various schedules.

## Application Information

Please refer to the online application process described on the NMSU Admissions website for specific instructions for each program.

## Geography

### Undergraduate Program Information

The Geography Program emphasizes the interaction of humans with the environment, and the program prepares students for professional positions in the public and private sectors, as well as for graduate work. The Department offers two concentrations for the major:

- The Geographic Information Science and Technology (GIS&T) Concentration emphasizes the acquisition of knowledge and skills in geographic information systems and remote sensing tools and concepts;
- The Human-Environment Relationships (HER) Concentration focuses on the analysis and interpretation of the coupled and complex interactions between people and the environment.

As detailed above, the Department also offers minors in Geography and GIS&T. The requirements for teaching fields in earth sciences are listed under the Department of Curriculum and Instruction in the College of Education.

*Note: A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.*

### Graduate Program Information

The Department of Geography offers graduate study leading to the Master of Applied Geography degree, with a specific focus on the use of geographic perspectives and tools to examine an array of applied research questions related to land use change, water resources, biogeography, desertification, landscape conservation, and urban and transportation planning. A minor in Geographic Information Science and Technology (GIS & T) is also available for all graduate students, regardless of major; details are provided above. Admission to the program is in accord with the general regulations of the Graduate School. Foreign students must receive a minimum score of 570 on the paper-based or 230 on the computer-based Test of English as a Foreign Language (TOEFL) examination. Any applicant who does not have an adequate undergraduate background in geography will be required to make up the deficiencies. Applicants must submit three letters of recommendation and a formal statement of intent to the Department as part of the application process. Please contact Dr. Daniel Dugas, Geography

Graduate Director (ddugas@nmsu.edu) if you have any questions about the program.

The Department is a sponsor of the interdisciplinary graduate degree program, which offers both MS and Ph.D. degrees in water science and management. Program details, application procedures, and funding resources are listed under the program description that is part of the College of Agricultural Consumer and Environmental Sciences, the lead College for the program. Interested students are encouraged to contact Dr. Christopher Brown, at (575) 646-1892 or brownchr@nmsu.edu, for more information.

The Department is also a participant in the Western Regional Graduate Program (WRGP) supported by the Western Interstate Commission of Higher Education (WICHE). The WRGP is a tuition-reciprocity arrangement that enables students that are legal residents in WICHE states (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming) to attend NMSU and pay the resident tuition rate, instead of the nonresident rate that an out-of-state student would normally pay.

The Department has a contract research laboratory (Spatial Applications Research Center-SpARC) and a state-of-the-art computer teaching laboratory, both of which support the full suite of ESRI and ENVI geo-spatial analytical software. The SpARC laboratory employs graduate students who work with local and state governments and research agencies, as well as with businesses on applied geography projects. Our teaching laboratory supports graduate students engaged in course work and research projects. The Department has good working relationships with the Water Resources Research Institute, the Jornada Experimental Range, the Physical Sciences Laboratory, and other units on campus. The Department has its own field equipment and field vehicle, which graduate students can use to support their thesis research. The potential for financial support exists for graduate students in Geography through teaching assistantships and research assistantships. Inquiries regarding the program and assistantships should be directed to the Dr. Daniel Dugas, Geography Graduate Director (ddugas@nmsu.edu). Financial aid questions should be addressed to the Office of Financial Aid at NMSU.

## Degrees for the Department

Geography - Bachelor of Science (p. 307)

Geography - Master of Applied Geography (p. 309)

## Minors for the Department

Geography - Undergraduate Minor (p. 309)

Geographic Information Science and Technology - Undergraduate Minor (p. 309)

Geographic Information Science and Technology - Graduate Minor (p. 310)

**Associate Professor, Carol Campbell, Department Head**

**Professors** DeMers; **Associate Professors** Brown, Buenemann, Campbell; **Assistant Professors** Dugas; **Adjunct Faculty** Rango, Whitford; **Professor Emeritus** Czerniak, Wright

*C. P. Brown, Ph.D., (California-Santa Barbara/San Diego State)– geographic information systems, water resources, U.S.-Mexico border environmental issues; M. Buenemann, Ph.D. (Oklahoma)– geographic information science and technology, land change science, drylands; C. L. Campbell, Department*

*Head, Ph.D. (UCLA)– biogeography, landscape ecology, remote sensing; M. N. DeMers, Ph.D. (Kansas)– geographic information science, landscape ecology, geographic education; D. Dugas, Ph.D. (Oregon)– geomorphology, physical geography;*

*Emeritus Faculty– R.J. Czerniak, Ph.D. (Colorado-Boulder)– land use and transportation planning, Europe, urban geography; J. B Wright, Ph.D. (California- Berkeley)– environmental conservation, cultural geography, American West*

## Geography Courses

### GEOG 111G. Geography of the Natural Environment

#### 4 Credits (3+3P)

Introduction to the physical processes that shape the human environment: climate and weather, vegetation dynamics and distribution, soil development and classification, and geomorphic processes and landform development.

### GEOG 112G. World Regional Geography

#### 3 Credits

Overview of the physical geography, natural resources, cultural landscapes, and current problems of the world's major regions. Students will also examine current events at a variety of geographic scales.

### GEOG 120G. Culture and Environment

#### 3 Credits

Study of human-environmental relationships: how the earth works and how cultures impact or conserve nature. Introduction to relationships between people and natural resources, ecosystems, global climate change, pollution, and conservation.

### GEOG 257. Introduction to Weather Science

#### 4 Credits (3+3P)

Introduction to Earth's atmosphere and the dynamic world of weather as it happens. Working with current meteorological data delivered via the Internet and coordinated with learning investigations keyed to the current weather; and via study of select archives. Crosslisted with: SOIL 257 and AGRO 257

**Prerequisite(s):** None.

### GEOG 259. Introduction to Oceanography

#### 4 Credits (3+3P)

Introduces the origin and development of the ocean and marine ecological concepts. Examines physical processes such as waves, tides, and currents and their impact on shorelines, the ocean floor, and basins. Investigates physical processes as they relate to oceanographic concepts. Includes media via the Internet and laboratory examination of current oceanic data as an alternative to the actual oceanic experience. Students will gain a basic knowledge and appreciation of the ocean's impact on the world's ecology. Branch campuses only. Consent of Instructor required.

### GEOG 281. Map Use: Reading, Analysis and Interpretation

#### 3 Credits (2+3P)

Exploration of the cartographic medium. Development of critical map analysis and interpretation skills, and map literacy. Comprised of traditional lecture, labs, and map use projects.

### GEOG 291. Special Topics

#### 1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**GEOG 295. Introduction to Climate Science****4 Credits (3+3P)**

Examines fundamentals and related issues of Earth's climate system, climate variability, and climate change. Develops solid understandings of Earth's climate system framed in the dynamic, Earth system based approach to the science. Branch Campuses only. May be repeated up to 4 credits.

**GEOG 315V. World Agriculture and Food Problems****3 Credits**

Same as AG E 315V.

**GEOG 325V. New Mexico and the American West****3 Credits**

Examination of the cultural and historical patterns, economic activities and physical characteristics of New Mexico with comparisons made with other western states.

**GEOG 326. U.S. National Parks****3 Credits**

Exploration of origins, landscapes, ecosystems, management issues, and conflicts in U.S. National Parks. The regional geography of the United States as seen through the creation and protection of biologically and culturally significant lands.

**GEOG 328V. Geography of Latin America****3 Credits**

Explores Latin America from a geographical perspective, integrating environmental, cultural and socioeconomic factors in an in-depth study of the development of the region and contemporary issues and challenges facing the region.

**GEOG 331V. Europe****3 Credits**

Focus on the cultural continent of Europe, from Iceland to the Ural Mountains and from Archangel, Russia, to Malta. An overview of climate, physical geography, and human geography of Europe, including a brief historical geography of the continent. Current environmental, social, and political issues of Europe will be discussed. A series of regional studies is also offered.

**GEOG 351. Fundamentals of Biogeography****3 Credits**

Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment; field and laboratory techniques including remote sensing. Taught with GEOG 557.

**GEOG 353. Geomorphology****3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 553. Crosslisted with: GEOL 353.

**Prerequisite(s):** C- or better in GEOL 111G OR GEOG 111G.

**GEOG 357. Climatology****3 Credits**

Elements and controls of climate. Energy and hydrologic cycles, general circulation, climate classification, distribution of climate types, microscale effects, applications. Same as AGRO 357, SOIL 357.

**Prerequisite(s):** C- or better in MATH 120.

**GEOG 361V. Economic Geography****3 Credits**

The geographic relationships of supply and demand resources, population, and transportation. Site analysis and decision-making in different economic systems and cultures and how these decisions affect the environment and the location of economic activities.

**GEOG 363V. Cultural Geography****3 Credits**

The world's diverse cultural landscapes. Emphasis on the connections between social, political, religious, and agricultural patterns and the impact of societies on the natural environment.

**GEOG 365V. Urban Geography****3 Credits**

The global historical development of urban areas, as well as the changing functions of today's cities. A comparison between the North American city system and cities in Europe, Asia, and South America, including the development of the city form, the internal spatial organization of commercial, residential, and industrial areas, and socio-economic and political factors.

**GEOG 373. Introduction to Remote Sensing****4 Credits (3+3P)**

Introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing products. Taught with GEOG 573.

**GEOG 381. Cartography and Geographic Information Systems****4 Credits (3+3P)**

Design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 571.

**GEOG 401. Internship/Co-op****1-3 Credits (1-3)**

Provides an opportunity whereby students work with a local, regional, or federal agency, or private sector firm on applied geographic work, under the supervision of an agency or firm professional and a geography faculty member. Consent of instructor required.

**GEOG 435. Environmental Planning****3 Credits**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 535.

**GEOG 441. System Design for Geographic Information Science and Technology (GIS&T)****3 Credits**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted system design methodologies intended to create a successful implementation of GIS inside organizations. Taught with GEOG 581.

**Prerequisite(s):** C- or better in GEOG 481.

**GEOG 452. Landscape Ecology****4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Taught with GEOG 552.

**Prerequisite(s):** C- or better in GEOG 351, BIOL 301, or other basic ecology course.

**GEOG 455. Southwest Environments****3 Credits**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 555.

**GEOG 467. Transportation Geography****3 Credits**

Nature and distribution of land, air and water transport facilities and their importance in regional development.

**Prerequisite(s):** C- or better in GEOG 120G.

**GEOG 472. Soil Morphology and Classification****4 Credits (2+2P)**

Same as SOIL 472. Crosslisted with: SOIL 472.

**GEOG 473. Advanced Remote Sensing****4 Credits (3+3P)**

Introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. Taught with GEOG 573.

**Prerequisite(s):** C- or better in GEOG 373.

**GEOG 481. Fundamentals of Geographic Information Science and Technology (GIS & T)****4 Credits (3+3P)**

Fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Taught with GEOG 578.

**Prerequisite(s):** C- or better in GEOG 281 or GEOG 381.

**GEOG 482. Geodatabase Design****3 Credits (2+3P)**

A practical introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally, implementation and documentation. Taught with GEOG 572.

**Prerequisite(s):** C- or better in GEOG 481.

**GEOG 483. Field Explorations in Geography****3 Credits**

A field-based class where students complete exercises in physical, human, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. Taught with GEOG 583.

**GEOG 488. GIS and Water Resources****3 Credits**

Explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student area of interest. Taught with GEOG 588.

**GEOG 491. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**GEOG 492. GIS&T Applications and Modeling****3 Credits**

Group oriented class in which students conduct an applied research project in GIS application or modeling area of choice and conduct focused library research. Taught with GEOG 521.

**Prerequisite(s):** C- or better in GEOG 481.

**GEOG 493. Special Problem Research****1-3 Credits**

For advanced and exceptional students. Research, and preparation of a paper in some phase of geography. A maximum of 6 credits may be earned. Consent of instructor required.

**GEOG 495. Directed Readings****1-3 Credits**

Individual study through selected readings. A maximum of 6 credits may be earned. Consent of instructor required.

**GEOG 501. Research Design and History of Geographic Thought****3 Credits**

Understanding and application of the research process, including conceptualization and definition of a research problem, study designs, data sources, data collection, and report writing in development of geographic thought.

**GEOG 521. GIS & T Applications and Modeling****3 Credits**

Group oriented class in which students conduct an applied research project in a GIS application or modeling area of choice and conduct focused library research. Taught with GEOG 492.

**GEOG 535. Environmental Planning****3 Credits**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 435.

**GEOG 552. Landscape Ecology****4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Taught with GEOG 452.

**GEOG 553. Geomorphology****3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 353.

**GEOG 555. Southwest Environments****3 Credits**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 455.

**GEOG 557. Fundamentals of Biogeography****3 Credits**

Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment; field and laboratory techniques including remote sensing. Taught with GEOG 351.

**GEOG 571. Cartography and Geographic Information Systems****4 Credits (3+3P)**

Graduate level design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 381.

**GEOG 572. Geodatabase Design****3 Credits (2+3P)**

Graduate level introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally implementation and documentation. Taught with GEOG 482.

**GEOG 573. Introduction to Remote Sensing****4 Credits (3+3P)**

Graduate level introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing product. Taught with GEOG 373.

**GEOG 578. Fundamentals of Geographic Information Science and Technology (GIS & T)****4 Credits (3+3P)**

Graduate level fundamentals of computer-based systems that organize, analyze, and present spatially referenced data. Taught with GEOG 481.

**GEOG 581. System Design for Geographic Information Science and Technology (GIS & T)****3 Credits**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted planning methodologies designed to create a successful implementation of GIS inside organizations. Taught with GEOG 441.

**GEOG 582. Advanced Remote Sensing****4 Credits (3+3P)**

Graduate level introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. May be repeated up to 4 credits.

**GEOG 583. Field Explorations in Geography****3 Credits**

A graduate level field-based class where students complete exercises in physical, cultural, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. May be repeated up to 3 credits.

**GEOG 585. Advanced Spatial Analysis****3 Credits (3+2P)**

Introduction to basic spatial and aspatial descriptive statistics, statistical analysis of point and area patterns, critical review of quantitative research in geography, and exploration of advanced spatial analysis routines including cluster analysis, hot/cold spot analysis, and spatially weighted regression.

**Prerequisite(s):** Knowledge of basic statistics recommended.

**GEOG 588. GIS and Water Resources****3 Credits**

This is a graduate level class that explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student's area of interest. Taught with GEOG 488.

**GEOG 595. Directed Readings****1-3 Credits**

Advanced individual study through selected readings. May be repeated for a maximum of 6 credits.

**GEOG 596. Residency****3-12 Credits**

A contractual learning experience in the public or private sector under the supervision of a field supervisor and two faculty members. Restricted to majors. PR/U grading only.

**GEOG 598. Selected Topics****1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected geographic themes. May be repeated for unlimited credit.

**GEOG 599. Master's Thesis****1-12 Credits (1-12)**

Supervised individual study of a student's thesis topic. May be repeated for an unlimited number of credits. Thesis/Dissertation Grading.

**Name:** Geography Office

**Office Location:** Breland Hall rm 137

**Phone:** (575) 646-3509

**Website:** <http://geography.nmsu.edu>

# Geography - Bachelor of Science

The department offers two concentrations for the major in Geography, please see below for more information.

## Concentration: Geographic Information Science and Technology (GIS &T)

The Geographic Information Science and Technology (GIS&T) Concentration offers a solid foundation in geographic thought and human and physical geography, and provides students with advanced knowledge and skills in spatial analysis and modeling through the use of geographic information systems and remote sensing tools and concepts. Preparation for advanced studies is also provided.

### Departmental Requirements

GEOG 111G	Geography of the Natural Environment	4
GEOG 112G	World Regional Geography	3
or GEOG 120G	Culture and Environment	
GEOG 281	Map Use: Reading, Analysis and Interpretation	3
GEOG 373	Introduction to Remote Sensing	4
GEOG 381	Cartography and Geographic Information Systems	4
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)	4
GEOG 482	Geodatabase Design	3

Select 6-7 credits from the following: 6-7

GEOG 441	System Design for Geographic Information Science and Technology (GIS&T)	
GEOG 473	Advanced Remote Sensing	
GEOG 488	GIS and Water Resources	
GEOG 491	Special Topics	
GEOG 492	GIS&T Applications and Modeling	

Select 9-10 credits from the following:<sup>1</sup> 9-10

### Physical Geography (PG)

GEOG 351	Fundamentals of Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Climatology	
GEOG 452	Landscape Ecology	

### Human Geography (HG)

GEOG 361V	Economic Geography	
GEOG 363V	Cultural Geography	
GEOG 365V	Urban Geography	
GEOG 467	Transportation Geography	

### Human Environment Geography (HEG)

Select one from the following: 3

GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Geography of Latin America	
GEOG 331V	Europe	
GEOG 483	Field Explorations in Geography	

### Non-Departmental Requirements

Select one from each of the following 3 categories: 3

Choose a Statistics class

A ST 251G	Statistics for Business and the Behavioral Sciences (or)	
STAT 251G	Statistics for Business and the Behavioral Sciences (or)	
A ST 311	Statistical Applications	
ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 190G	Trigonometry and Precalculus	

**Second Language Requirement: (required - see below)** 4-18

### Electives

Select sufficient electives to total 120 credits, including 48 upper-division credits. 51

Total Credits 107-123

<sup>1</sup> Select either one Physical Geography (PG) class and two Human Geography (HG) classes, OR two Physical Geography (PG) classes and one Human Geography (HG) class.

## Second Language Requirement

For the Bachelor of Science in the Geography with a Concentration in GIS&T there is a one year second language requirement, the student must do one of the following:

### Option 1:

**Complete two semesters from the following:**

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

### For Heritage Learners:

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

### Option 2:

**Complete 6 additional upper-division Geography courses (beyond major requirements)** 6

### Option 3:

**Challenge the 112 level for the following courses:**

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	

OR

**Challenge the 213 level for the following courses:**

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Concentration: Human/Environment Relationships (HER)

The Human Environment Relationships Concentration offers a solid foundation in geographic thought and geospatial analysis and provides students with advanced knowledge and skills for assessing human and environmental systems and the coupled and complex interactions between people and the environment. Preparation for advanced graduate studies is also provided.

**Departmental Requirements**

GEOG 111G	Geography of the Natural Environment	4
GEOG 112G	World Regional Geography	3
GEOG 120G	Culture and Environment	3
GEOG 281	Map Use: Reading, Analysis and Interpretation	3
GEOG 381	Cartography and Geographic Information Systems	4
GEOG 455	Southwest Environments	3

**Human Geography (HG)**

Select two from the following: <sup>1</sup>		6
GEOG 361V	Economic Geography	
GEOG 363V	Cultural Geography	
GEOG 365V	Urban Geography	
GEOG 467	Transportation Geography	

**Physical Geography (PG)**

Select 6-7 credits from the following: <sup>1</sup>		6-7
GEOG 351	Fundamentals of Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Climatology	

GEOG 452	Landscape Ecology	
<b>Human-Environment Geography (HEG)</b>		
Select two from the following: <sup>1</sup>		6
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Geography of Latin America	
GEOG 331V	Europe	
GEOG 483	Field Explorations in Geography	

**Non-Departmental Requirements**

ENGL 218G	Technical and Scientific Communication	3
or ENGL 318G	Advanced Technical and Professional Communication	
MATH 121G	College Algebra	3
Select one from the following:		3
A ST 251G	Statistics for Business and the Behavioral Sciences (or)	
STAT 251G	Statistics for Business and the Behavioral Sciences (or)	
A ST 311	Statistical Applications	

**Second Language Requirement: (required - see below)** 4-18

**Electives**

Select sufficient electives to total 120 credits, including 48 upper-division credits. 54

Total Credits 105-120

<sup>1</sup> HER students will also take one more class from the Human, Physical, or Human Environment Geography class areas.

## Second Language Requirement

For the Bachelor of Science in the Geography with a Concentration in HER there is a one year second language requirement, the student must do one of the following:

**Option 1:**

**Complete two semesters from the following:**

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

**For Heritage Learners:**

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

**Option 2:**

**Complete 6 additional upper-division Geography courses (beyond major requirements)** 6

**Option 3:**

**Challenge the 112 level for the following courses:**

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	

OR

**Challenge the 213 level for the following courses:**

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Geographic Information Systems - Undergraduate Minor

The Department of Geography offers a minor in Geographic Information Systems; this option applies for non-geography majors only. To earn a minor in GIS, the following courses are required. *Note: A grade of C- or better is required for all courses taken for the minor. Students may not take any of these courses S/U.*

**Departmental Requirements**

GEOG 373	Introduction to Remote Sensing	4
GEOG 381	Cartography and Geographic Information Systems	4
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)	4
GEOG 482	Geodatabase Design	3
Select 6-7 credits from the following:		6-7
GEOG 441	System Design for Geographic Information Science and Technology (GIS&T)	
GEOG 473	Advanced Remote Sensing	
GEOG 488	GIS and Water Resources	

GEOG 492	GIS&T Applications and Modeling	
Total Credits		21-22

## Geography - Undergraduate Minor

The Department of Geography offers a minor in Geography to interested undergraduate students from departments outside of Geography. To earn a minor in Geography, the following courses are required. *Note: A grade of C- or better is required for all courses taken for the minor. Students may not take any of these courses S/U.*

**Departmental Requirements**

GEOG 111G	Geography of the Natural Environment	4
GEOG 112G	World Regional Geography	3
or GEOG 120G	Culture and Environment	
Select 3-4 credits from the following:		3-4
GEOG 281	Map Use: Reading, Analysis and Interpretation	
GEOG 381	Cartography and Geographic Information Systems	
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)	

*Physical Geography (PG)*

Select one from the following:		3-4
GEOG 351	Fundamentals of Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Climatology	
GEOG 452	Landscape Ecology	

*Human Geography (HG)*

Select one from the following:		3
GEOG 361V	Economic Geography	
GEOG 363V	Cultural Geography	
GEOG 365V	Urban Geography	
GEOG 467	Transportation Geography	

*Human-Environment Geography (HEG)*

Select one from the following:		3
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Geography of Latin America	
GEOG 331V	Europe	
GEOG 483	Field Explorations in Geography	

Total Credits		19-21
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## Geography - Master of Applied Geography

The basic requirement for the Master of Applied Geography is a minimum of 30 graduate credits, including 6 thesis credits and a successful thesis defense. Students choosing the thesis option are required to file a digital copy of the thesis and thesis data that will be archived on the Departmental Website and the Departmental server. A non-thesis option requires 36 graduate credits with a minimum of 3 credits of professional residency and an approved final residency report. Students choosing the non-thesis option are required to file a digital copy of their residency report that will be archived on the Departmental Website and the Departmental server. All candidates must maintain an overall GPA of

3.00 or higher. All candidates must also receive a grade of B or better in the following required courses: GEOG 501 Research Design and History of Geographic Thought; GEOG 585 Advanced Spatial Analysis; and one graduate-level GIS&T course, either prior to entering the program or before graduation. A total of at least 15 credits must be earned in courses numbered 500 and above, and no more than 9 credits of the 30 (thesis option) or 36 (non-thesis option) can be earned outside of geography.

## Geographic Information Systems- Graduate Minor

The Department of Geography offers a minor in Geographic Information Systems, and this minor is available for all graduate students. To earn a minor in GIS, the following courses are required, combining for a total of 14 credits. Students may not take any of these courses S/U, and students must earn a grade of at least B- in all of these classes.

### Requirements

GEOG 573	Introduction to Remote Sensing	4
GEOG 578	Fundamentals of Geographic Information Science and Technology (GIS & T)	4
Select 6 credits from the following:		6
GEOG 521	GIS & T Applications and Modeling	
GEOG 571	Cartography and Geographic Information Systems	
GEOG 572	Geodatabase Design	
GEOG 581	System Design for Geographic Information Science and Technology (GIS & T)	
GEOG 582	Advanced Remote Sensing	
GEOG 588	GIS and Water Resources	
GEOG 598	Selected Topics	
Total Credits		14

## Geological Sciences Undergraduate Program Information

A degree in geology leads to a wide variety of career choices. Students can access careers in the geosciences through one of three concentrations in the BS Geology degree. The first concentration is Geological Sciences. This is a traditional geology curriculum, in which students take geology classes, augmented with calculus, physics, and chemistry; this concentration leads to graduate study in the geosciences and careers in industry, academia, government, and policy. The second concentration is Earth and Environmental Systems. Students take geology classes, augmented with a variety of environmental, economic, and political classes; this concentration leads to careers in the environmental industry. The third concentration is Earth Science Education. Students take geology and education classes, and are certified to teach science at New Mexico middle and high schools after completing the BS and one year of graduate work in the College of Education.

Students earning the BS in Geology, any concentration, may also earn the Undergraduate Research Certificate in the Department of Geological Sciences. Completion of the Undergraduate Research Certificate includes completion of an undergraduate research project, participation in the department's undergraduate research meetings and one of the following:

1. a senior thesis;
2. a manuscript submitted for a publication; or
3. an oral or poster presentation at a national or regional meeting.

Undergraduate Research Certificates are presented at the department's annual awards ceremony.

The Department of Geological Sciences also cooperates with the Department of Physics in offering a BS degree in physics with a concentration in geophysics. Requirements are listed in the Department of Physics (p. 407) section of this catalog.

## Graduate Program Information

The Department of Geological Sciences offers graduate study leading to the Master of Science degree in geology. The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, geochronology, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory, plus computer, geochemical and petrographic labs. Major equipment includes a Gemini heavy mineral separation table, Laser-Induced Breakdown Spectroscopy (LIBS), a class 1000 clean lab, Thermal Ionization Mass Spectrometry (TIMS) and Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LA-MC-ICP-MS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor. Admission to the program is in accord with the general regulations of the Graduate School. The Graduate Record Examination (verbal, quantitative, and analytical writing only) is required.

## Degrees for the Department

Geology - Bachelor of Science (p. 313)

Geology - Master of Science (p. 316)

## Minors for the Department

Geology - Undergraduate Minor (p. 316)

**Professor, Nancy J. McMillan, Department Head**

**Professors** Amato, McMillan; **Associate Professor** Ramos; **Assistant Professors** Burgette, Hampton, Johnson; **Adjunct Professors** G. Brown, K. Davis, J. Witcher; **Emeritus Faculty** Lawton, Mack

*N. J. McMillan, Department Head, Ph.D. (Southern Methodist)– igneous petrology, geochemistry; J. M. Amato, Ph.D. (Stanford)– structural geology, tectonics; F. C. Ramos, Ph.D. (California- Los Angeles)– isotope geochemistry, petrology; R. J. Burgette, Ph.D. (Oregon)- neotectonics; B.A. Hampton, Ph.D. (Purdue)- sedimentology, tectonics; E.R. Johnson, Ph.D. (Oregon)- igenous petrology, volcanology; T.F. Lawton, Ph.D. (Emeritus) (Arizona)- stratigraphy, basin analysis; G.H. Mack, Ph.D. (Emeritus) (Indiana-Bloomington)- sedimentary petrology, sedimentology.*

## Geology Courses

### GEOL 111G. Introductory Geology 4 Credits (3+3P)

Covers the fundamental principles of physical geology, including the origin of minerals and rocks, geologic time, rock deformation, and plate tectonics. May be repeated up to 4 credits.

**GEOL 212G. The Dynamic Earth****4 Credits (3+3P)**

Introduction to earth systems. Geology and the solid earth, geologic time and earth history, water and the world oceans, atmosphere and weather, the solar system. Community Colleges only.

**GEOL 220. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits.

**GEOL 305V. Fossils and the Evolution of Life****3 Credits**

Examination of the fossil record within the context of geologic time. Special emphasis on critical evaluation of possible terrestrial and extra-terrestrial causes for the evolution of plants and animals and for periods of mass extinction.

**GEOL 310. Mineralogy****3 Credits (2+3P)**

Crystallography and the physical and chemical aspects of minerals. **Prerequisite(s):** GEOL 111G and CHEM 111G.

**GEOL 312. Optical Mineralogy****3 Credits (2+3P)**

Principles of optical mineralogy as applied to the identification and characterization of rock-forming minerals.

**Prerequisite or Corequisite:** GEOL 310.

**GEOL 320. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**GEOL 335V. Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present****3 Credits**

This class will provide an introduction to geologic hazards and natural disasters, their effects on society and the attempts at preparation and mitigation for these events. Hazards to be covered include earthquakes, volcanic eruptions, floods, landslides, hurricanes, tsunamis and others.

**GEOL 353. Geomorphology****3 Credits (2+3P)**

Same as GEOG 353. May be repeated up to 3 credits.

**GEOL 360. General Geochemistry****3 Credits**

The chemistry of the earth and its parts, with emphasis on geochemical systems and cycles, distribution of the elements, and mineral equilibria. Crosslisted with: CHEM 360

**Prerequisite(s):** CHEM 111G or CHEM 110G.

**GEOL 399. Igneous and Metamorphic Petrology****3 Credits (2+3P)**

Mineralogical composition, classification, and genesis of igneous and metamorphic rocks.

**Prerequisite(s):** GEOL 312 for geology majors, GEOL 310 for majors other than geology.

**GEOL 401. Geology Colloquium****1 Credit**

Presentations by visiting speakers and students. May be repeated up to 6 credits.

**GEOL 420. Stratigraphy and Sedimentology****3 Credits (2+3P)**

Identification and interpretation of sedimentary rocks with emphasis on classification, deposition, and stratal geometry.

**Prerequisite:** GEOL 310.

**GEOL 424. Soil Chemistry****3 Credits**

Same as SOIL 424, CHEM 424.

**GEOL 434. Tectonics of Sedimentary Basins****3 Credits**

Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Crosslisted with: GEOL 534.

**Prerequisite(s):** GEOL 420.

**GEOL 441. Tutorial Geology****2 Credits (1+3P)**

Participation in teaching lower-division laboratories and conducting tutorial sessions. May be repeated for a total of 4 credits.

**Prerequisite:** junior or above standing and nomination by faculty.

**GEOL 442. Zuhl Collection Internship****1-3 Credits (3-9P)**

Applied experience with the NMSU Zuhl Collection, under supervision of the Zuhl Collection Director. Possible activities include developing displays, giving tours, developing outreach materials, etc. May be repeated up to 6 credits. Consent of Instructor required.

**GEOL 444. GIS for Geology****3 Credits**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOG 544.

**Prerequisite(s):** GEOL 470.

**GEOL 449. The Geological Profession****1 Credit**

Outcomes assessment exit exams. For graduating seniors only. May be repeated up to 1 credits.

**Prerequisite(s):** Graduating seniors only.

**GEOL 452. Geohydrology****4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits.

Crosslisted with: E S 452 and C E 452.

**Prerequisite(s):** Junior or senior, MATH 121G.

**GEOL 455. Undergraduate Research****1-3 Credits**

Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**GEOL 465. Isotope Geochemistry****3 Credits**

Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences.

**Prerequisite(s):** CHEM 112G, GEOL 360, GEOL 399.

**GEOL 470. Structural Geology****3 Credits (2+3P)**

Deformation of rocks of the earth. Prerequisite: GEOL 310

**GEOL 471. Volcanology****3 Credits**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruption dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 571.

**Prerequisite(s):** GEOL 399.

**GEOL 475. Geology of Mineral Resources****3 Credits (2+3P)**

Introduction to ore deposits and industrial rocks and minerals; genesis, mining methods, estimation of reserves, exploration, and economic aspects of selected commodities.

**Prerequisite:** GEOL 399.

**GEOL 477. Special Problems****1-3 Credits**

Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits.

**Prerequisite:** consent of instructor.

**GEOL 478. Petroleum Systems and Stratigraphy****3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments, and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips. May be repeated up to 3 credits.

**Prerequisite(s):** GEOL 420.

**GEOL 480. Seminar****1-3 Credits**

Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**GEOL 482. Zuhl Collection Internship****1-3 Credits (1-3)**

Applied experience working with the Zuhl Collection of rocks, minerals, fossils, and petrified wood, supervised by the Director of the Zuhl Collection. Activities include tours, display development, research on aspects of the collection, and other work in the museum. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: GEOL majors.

**GEOL 490. Field Geology****3 Credits**

Mapping, instrumentation, and interpretation of geology in the field.

**Prerequisites:** either GEOL 420 and GEOL 470.

**GEOL 491. Tectonic Evolution of North America****3 Credits**

Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development.

**Prerequisites:** GEOL 111G, GEOL 399, GEOL 420 and GEOL 470.

**GEOL 495. Geology Field Camp****4 Credits**

Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490

**GEOL 499. Senior Thesis****1-3 Credits**

Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Restricted to majors.

**Prerequisite:** consent of instructor.

**GEOL 501. Geology Colloquium****1 Credit**

Presentations by visiting speakers and graduate students.

**GEOL 520. Selected Topics****1-3 Credits**

Selected topics in geology. May be repeated for unlimited credit.

**Prerequisites:** graduate standing and consent of instructor.

**GEOL 534. Tectonics of Sedimentary Basins****3 Credits**

Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Restricted to: GEOL majors.

**Prerequisites:** GEOL 420 or equivalent or consent of instructor.

**GEOL 537. Topics in Volcanology****3 Credits**

A seminar-style class exploring volcanic processes. Course topics vary by semester and include: magmatism and volcanism at different tectonic settings (subduction zones, intraplate) and plumbing systems and eruptions of volcanoes (calderas, monogenetic volcanoes).

**GEOL 544. GIS for Geology****3 Credits**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOL 444.

**Prerequisite(s):** GEOL 470 or equivalent.

**GEOL 558. Neotectonics****3 Credits**

Recognition, measurement, and dating of deformation related to earthquakes in the Quaternary geologic record.

**GEOL 562. Analytical Geochemistry****3 Credits**

Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.

**GEOL 565. Isotope Geochemistry****3 Credits**

Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.

**GEOL 571. Volcanology****3 Credits**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruptions dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 471.

**GEOL 578. Petroleum Systems and Stratigraphy****3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips.

**GEOL 582. Plate Tectonics**

**3 Credits**

Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.

**GEOL 585. Geochronology**

**3 Credits**

The principles, analytical methods, and interpretation of the most common geochronologic methods.

**GEOL 598. Special Research Programs**

**1-3 Credits**

Investigations into contemporary geological problems. May be repeated for unlimited credit.

**Prerequisites:** graduate standing and consent of instructor.

**GEOL 599. Master's Thesis**

**15 Credits**

Thesis research.

**Name:** Nancy J. McMillan (nmcmillan@nmsu.edu), **Department Head**

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**Email:** [geology@nmsu.edu](mailto:geology@nmsu.edu)

## Geology - Bachelor of Science Concentration: Geological Sciences

The concentration in geological sciences is a broad field of study that prepares students for employment by energy and mineral industries, environmental and water resource companies, federal, state and local governments, as well as service companies that utilize earth resources. Qualified students are also prepared for graduate study in the geological sciences.

**Departmental Requirements**<sup>1</sup>

GEOL 111G	Introductory Geology	4
or HON 219G	Earth, Time, and Life	
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 310	Mineralogy	3
GEOL 312	Optical Mineralogy	3
GEOL 360	General Geochemistry	3
GEOL 399	Igneous and Metamorphic Petrology	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
GEOL 470	Structural Geology	3
GEOL 490	Field Geology	3
GEOL 491	Tectonic Evolution of North America	3
GEOL 495	Geology Field Camp	4

**Elective Requirements**<sup>1</sup>

Select 12 credits from the following:		12
C E 357	Soil Mechanics	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	

GEOL 353	Geomorphology	
GEOL 424	Soil Chemistry	
GEOL 434	Tectonics of Sedimentary Basins	
GEOL 444	GIS for Geology	
GEOL 452	Geohydrology	
GEOL 465	Isotope Geochemistry	
GEOL 475	Geology of Mineral Resources	
GEOL 478	Petroleum Systems and Stratigraphy	
GEOL 480	Seminar	
SOIL 252	Soils	

**Nondepartmental Requirements**<sup>1</sup>

CHEM 111G	General Chemistry I <sup>2</sup>	4
or CHEM 115	Principles of Chemistry I	
CHEM 112G	General Chemistry II <sup>2</sup>	4
or CHEM 116	Principles of Chemistry II	
Select one of the following (8 or 6 credits):		8
MATH 191G & MATH 192G	Calculus and Analytic Geometry I and Calculus and Analytic Geometry II	
MATH 235 & MATH 236	Calculus for the Technical Student I and Calculus for the Technical Student II	
PHYS 211G	General Physics I	3
or PHYS 215G	Engineering Physics I	
PHYS 212G	General Physics II	3
or PHYS 216G	Engineering Physics II	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 215GL	Engineering Physics I Laboratory	
PHYS 212GL	General Physics II Laboratory	1
or PHYS 216GL	Engineering Physics II Laboratory	

**Second Language Requirement: (required- see below)**

Select 8 credits from two semesters of a second language (see the section at the bottom of the page)		8
Select 3-4 credits from the following:		3-4

C S 150	C Programming	
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 155	Internet Programming I	
C S 158	R Programming I	
C E 151	Introduction to Civil Engineering	
GEOG 381	Cartography and Geographic Information Systems	
STAT 271G	Statistics for Psychological Sciences	
STAT 371	Statistics for Engineers and Scientists I	

Select sufficient electives, including those selected to satisfy the college and university requirements, to total 120 credits, of which 48 must be upper-division (300 or above).

Total Credits	119-120
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<sup>1</sup> May not be taken S/U and a grade of C- or better must be earned.

<sup>2</sup> CHEM 115 Principles of Chemistry I and CHEM 116 Principles of Chemistry II: Preferred

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

## Concentration: Earth and Environmental Systems

The concentration in geological sciences provides students with scientific insight as a foundation for careers in environmental earth science, environmental policy and resource management. Qualified students are also prepared for graduate study in these areas. This concentration does not prepare students for graduate study in the geological sciences; these students should follow the curriculum in the Geological Sciences Concentration.

### Departmental Requirements <sup>1</sup>

GEOL 111G	Introductory Geology	4
or HON 219G	Earth, Time, and Life	
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 310	Mineralogy	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GEOL 360	General Geochemistry	3
GEOL 399	Igneous and Metamorphic Petrology	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
GEOL 470	Structural Geology	3
GEOL 491	Tectonic Evolution of North America	3

### Elective Requirements <sup>1</sup>

Select 9 credits from the following:		9
GEOL 312	Optical Mineralogy	
GEOL 353	Geomorphology	
GEOL 424	Soil Chemistry	
GEOL 434	Tectonics of Sedimentary Basins	
GEOL 452	Geohydrology	
GEOL 465	Isotope Geochemistry	
GEOL 475	Geology of Mineral Resources	
GEOL 478	Petroleum Systems and Stratigraphy	
GEOL 480	Seminar	
GEOL 490	Field Geology	
GEOL 495	Geology Field Camp	
C E 357	Soil Mechanics	
SOIL 252	Soils	
SPED 350	Introduction to Special Education in a Diverse Society	

### Nondepartmental Requirements <sup>1</sup>

A ST 311	Statistical Applications	3
AG E 337V	Natural Resource Economics	3
or AG E 384V	Water Resource Economics	
BIOL 111G	Natural History of Life	3
CHEM 111G	General Chemistry I	4
ECON 252G	Principles of Microeconomics	3
GEOG 120G	Culture and Environment	3

GEOG 381	Cartography and Geographic Information Systems	4
PHYS 211G	General Physics I	3
PHYS 211GL	General Physics I Laboratory	1
<b>Second Language Requirement: (required- see below)</b>		
Select 8 credits from two semesters of a second language (see the section at the bottom of the page)		8
Select two from the following:		6
GOVT 324	Environmental Policy	
GOVT 343	Congress and the Legislative Process	
GOVT 395	Law and Society	
GOVT 399	New Mexico Law	
Select sufficient electives, including those selected to satisfy the college and university requirements, to total 120 credits, of which 48 must be upper-division (300 or above).		41
Total Credits		120

<sup>1</sup> May not be taken S/U and a grade of C- or better must be earned.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

## Concentration: Earth Science Education

The concentration in earth science education is a collaboration between the Department of Geological Sciences and the Department of Curriculum and Instruction in the College of Education. In this option, students earn a Secondary Licensure as well as a BS in Geology, and become qualified to teach the Broad Sciences at the middle and high school levels. Students take one year of graduate classes in the College of Education to complete the Secondary Licensure.

### Departmental Requirements <sup>1</sup>

GEOL 111G	Introductory Geology	4
or HON 219G	Earth, Time, and Life	
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 310	Mineralogy	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GEOL 360	General Geochemistry	3
GEOL 399	Igneous and Metamorphic Petrology	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 444	GIS for Geology	3
GEOL 449	The Geological Profession	1
GEOL 470	Structural Geology	3
GEOL 491	Tectonic Evolution of North America	3

### Nondepartmental Requirements <sup>1</sup>

ASTR 105G	The Planets	4
or ASTR 110G	Introduction to Astronomy	
BIOL 111G	Natural History of Life	3
BIOL 111GL	Natural History of Life Laboratory	1
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
C EP 110G	Human Growth and Behavior	3
C EP 210	Educational Psychology	3

CHEM 111G	General Chemistry I <sup>2</sup>	4
or CHEM 115	Principles of Chemistry I	
CHEM 112G	General Chemistry II <sup>2</sup>	4
or CHEM 116	Principles of Chemistry II	
EDLT 368	Integrating Technology with Teaching	3
EDUC 315	Multicultural Education	3
EDUC 381	Secondary Field Experience	3
PHYS 211G	General Physics I	3
or PHYS 215G	Engineering Physics I	
PHYS 212G	General Physics II	3
or PHYS 216G	Engineering Physics II	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 215GL	Engineering Physics I Laboratory	
PHYS 212GL	General Physics II Laboratory	1
or PHYS 216GL	Engineering Physics II Laboratory	
<b>Second Language Requirement: (required- see below)</b>		
Select 8 credits from two semesters of a second language (see section at the bottom of the page)		8
Select sufficient electives, including those selected to satisfy the college and university requirements, to total 120 credits, of which 48 must be upper-division (300 or above).		38
Total Credits		120

<sup>1</sup> May not be taken S/U and a grade of C- or better must be earned.

<sup>2</sup> CHEM 115 Principles of Chemistry I and CHEM 116 Principles of Chemistry II: Preferred.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

After completing the BS in Geology, Concentration Earth Science Education, students should apply and be admitted to the Graduate School in the Department of Curriculum and Instruction, and be admitted to the Teacher Education Program (TEP). For additional details, see the Curriculum and Instruction (p. 480) portion of the NMSU Graduate Catalog.

## Secondary Teaching Licensure

To earn the Secondary Teaching Licensure, students must complete these courses and pass the NMTA Basic Skills, NMTA General Knowledge, and NMTA Content Knowledge Licensure Exams:

### Required Courses

EDUC 505	Classroom Management	3
EDUC 509	Teaching Methods Laboratory	3
EDUC 510	Internship/Student Teaching	6
EDUC 563	Teaching Science at the Middle and High School Level	3
RDG 514	Content Area Literacy	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
Total Credits		21

## Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the student must do one of the following:

### Option 1:

Complete two semesters from the following:

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

*For Heritage Learners:*

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

### Option 3:

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	

OR

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Geology - Undergraduate Minor

A student cannot earn a BS in Geology and also earn a minor in Geology.

**Required Courses**

GEOL 111G	Introductory Geology	4
or HON 219G	Earth, Time, and Life	
GEOL 305V	Fossils and the Evolution of Life	3
Select 12 credits from the following:		12
GEOL 310	Mineralogy	
GEOL 312	Optical Mineralogy <sup>1</sup>	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 353	Geomorphology	
GEOL 360	General Geochemistry	
GEOL 399	Igneous and Metamorphic Petrology <sup>1</sup>	
GEOL 420	Stratigraphy and Sedimentology <sup>1</sup>	
GEOL 434	Tectonics of Sedimentary Basins	
GEOL 444	GIS for Geology	
GEOL 465	Isotope Geochemistry <sup>1</sup>	
GEOL 470	Structural Geology <sup>1</sup>	
GEOL 475	Geology of Mineral Resources <sup>1</sup>	
GEOL 477	Special Problems (variable credit) <sup>1</sup>	
GEOL 478	Petroleum Systems and Stratigraphy <sup>1</sup>	
GEOL 480	Seminar (variable credit) <sup>1</sup>	
GEOL 490	Field Geology <sup>1</sup>	
GEOL 491	Tectonic Evolution of North America <sup>1</sup>	
GEOL 495	Geology Field Camp <sup>1</sup>	
Total Credits		19

<sup>1</sup> Courses with Geology prerequisites other than GEOL 111G Introductory Geology or HON 219G Earth, Time, and Life.

## Geology - Master of Science

A candidate for a master's degree must complete a minimum of 30 graduate credits, including a minimum of 6 credits for thesis (GEOL 599 Master's Thesis). No more than 5 thesis credits may be taken in any one semester. Early selection of a research advisor is encouraged. A thesis proposal must be approved by the advisor and the candidate's committee before registering for thesis credits. At least 15 credits must be earned in courses numbered 500 or above, and at least 15 credits must be earned in geology. Students are expected to participate in the department's colloquium each semester. The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, geochronology, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory,

plus computer, geochemical and petrographic labs. Major equipment includes a Gemini heavy mineral separation table, X-Ray Fluorescence Spectrometry (XRF), Laser-Induced Breakdown Spectroscopy (LIBS), a class 1000 clean lab, Thermal Ionization Mass Spectrometry (TIMS) and Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LA-MC-ICP-MS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor.

## Government

### Undergraduate Program Information

The study of government and political science blends the strengths of a liberal arts education while preparing students for a career in their field. Career opportunities can include positions in: federal, state, and local government; public administration and public service; and in public policy analysis.

The government major program calls for a thorough preparation in the study of government as described below with the opportunity for those interested in specific careers to concentrate in one of the subfields:

- American government and politics,
- public law,
- public administration and policy,
- comparative politics,
- political theory and
- international relations.

The department also offers a supplementary major in law and society, which is supportive of law-related careers.

A government minor program involving 18 credits of course work is also offered. A subfield minor or a general minor may be selected. In addition, the department participates in an interdisciplinary minor in Contemporary Social Studies.

### Graduate Program Information

The Department of Government offers two degrees:

- the Master of Arts (MA) in government and
- the Master of Public Administration (MPA) and
- a graduate minor in Security Studies.

The programs are designed to prepare students both for diverse careers in the public sector and for further training at the doctoral level. The MPA program is accredited by the Network of Schools of Public Policy, Affairs and Administration (NASPAA), a distinction held by fewer than one-quarter of MPA programs nationwide. The MPA program offers joint degrees

- with the Department of Criminal Justice (MPA/MCJ) and
- with the Department of History (MPA/ MA in Public History).

Students in a joint degree program can earn two master's degrees with fewer credits than would be required to earn those degrees independently.

## Admission

Prospective graduate students in either the MA or MPA should demonstrate a 3.0 grade point average for the second half of their undergraduate course work. For students with a GPA of less than 3.0, GRE scores are required, though this requirement may be waived if the undergraduate degree was awarded more than five years before applying. Applicants to either program are required to submit an application online. See instructions at: <http://prospective.nmsu.edu/graduate/apply/index.html>. Applications include three letters of recommendation, a writing sample, and a personal statement concerning their interest in pursuing a graduate degree. Additional information concerning program requirements and the admission process can be obtained from either the department's MA chair or MPA director. Under exceptional circumstances the department may exempt students from the minimal requirements. Application for admission to the Graduate School should clearly indicate the program in which the student wishes to enroll. Applications for admission to the MPA program are reviewed twice a year, once in the Fall semester and once in the Spring semester.

Students interested in a joint degree option must apply and be accepted in to the two departments separately, and indicate their interest on their applications in one of the joint degree programs.

## General Requirements

Students in both the MA and MPA programs select either a thesis or non-thesis option. Students planning on continuing their studies in a doctoral program or wishing to establish expertise related to a specific career objective are strongly encouraged to select the thesis option. The non-thesis option is suggested for students desiring immediate employment or seeking to enhance their current employment situations. Course work outside the department must have prior advisor approval to ensure a well-integrated program of study. Complete information on the requirements for either program should be obtained directly from the department. Most MA and MPA courses are offered in the evening.

## Minors

The Department of Government offers a general undergraduate Government minor and specialized sub field minors. In addition, the department participates in an interdisciplinary minor in Contemporary Social Studies with History and other departments.

A student cannot earn both a B.A. in Government and a general minor in Government. Government majors may pursue a subfield minor in the department, however, they cannot double count any upper division courses in Government toward the minor.

## Degrees for the Department

Government - Bachelor of Arts (p. 322)

Law and Society - Supplemental Major (p. 325)

Government - Master of Arts (p. 325)

Public Administration - Master of Public Administration (p. 326)

MPA-MCJ Program - Dual Degree (p. 326)

MPA-MA Public History Program - Dual Degree (p. 326)

## Minors for the Department

American Government and Politics - Undergraduate Minor (p. 323)

Comparative Politics - Undergraduate Minor (p. 323)

International Relations - Undergraduate Minor (p. 324)

Political Theory - Undergraduate Minor (p. 324)

Public Administration - Undergraduate Minor (p. 324)

Public Law - Undergraduate Minor (p. 325)

Government - Undergraduate Minor (p. 324)

Security Studies - Graduate Minor (p. 326)

### Professor, Neil Harvey, Department Head

**Professors** Butler, Harvey, Slaton; **Associate Professors** Conner, Medina, Rosendorf; **Assistant Professors** Hirschauer, Kang; **College Professor** Seckler; **Emeritus Professors** Baker, Lapid, Taggart, Winn

*N. Harvey, Ph.D., Department Head (Essex)– Mexican politics, comparative politics, Latin America; N. Baker, (emeritus) Ph.D. (Tulane)– public law, American politics, presidency; G. Butler, Ph.D., (Catholic)– political theory, American politics; T. Conner, Ph.D., (Oklahoma) - public administration, Native American politics, public budgeting; S. Hirschauer, Ph.D., (Old Dominion University) - Intenational relations, security studies, gender, migration and identity, comparative politics; S. Kang, Ph.D., (Univ. Georgia)- public and non-profit management, organizational theory and behavior, public sector volunteering; Y. Lapid, (emeritus) Ph.D., (Columbia)– international relations theory, comparative foreign policy, international organizations; C. Medina (Univ. Colorado Denver) Ph.D., – public administration, public policy, education policy, qualitative methods; N. Rosendorf, Ph.D., (Harvard) international relations, cultural diplomacy, US foreign policy; K. Seckler, J.D. (Univ. of New Mexico)- Law and Society, New Mexico state and local government, US Supreme Court, US and NM Constitutions; C. Slaton, Ph.D., (Hawaii) - American politics, American political thought, university and community engagement, public administration, conflict resolution; W. Taggart, (emeritus) Ph.D., (Florida State)– public administration, public policy, American politics; R. G. Winn, (emeritus), Ph.D., (Arizona State)– public administration, policy analysis, environmental policy*

## Government Courses

### GOVT 100G. American National Government

#### 3 Credits

Class critically explores political institutions and processes including: the U.S. constitutional system; legislative, executive and judicial processes; political parties, elections, media, policy making, civic participation, popular and group influence

### GOVT 101. Introductory Government Seminar

#### 1 Credit

Introduction to the government major. Designed to assist students in planning college experience and preparing for professional or advanced educational opportunities upon graduation. Graded: S/U. Restricted to: Main campus only.

### GOVT 110G. Introduction to Political Science

#### 3 Credits

This class covers fundamental concepts such as justice, sovereignty and power; political theories and ideologies; and government systems that range from democratic to authoritarian.

### GOVT 150G. American Political Issues

#### 3 Credits

Major contemporary problems of American society and their political implications.

**GOVT 160G. International Political Issues****3 Credits**

Current developments and issues in world politics.

**GOVT 201. Special Topics****3 Credits**

Specific topics to be announced in Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

**GOVT 300. Political Research Skills****3 Credits**

Introduction to methods of political analysis and fundamentals of research design, including basic methods for the collection and analysis of political data.

**GOVT 308. Prepping for Law School Admissions Test****1 Credit**

This workshop helps students prepare to take the Law School Admissions Test and apply for law school. Graded: S/U.

**GOVT 313. Model United Nations****3 Credits**

Issues related to the United Nations and international law/organizations through simulations, discussions and research projects.

**Prerequisites:** GPA of 2.5 or better and consent of instructor.

**GOVT 314. Advanced Model UN****3 Credits**

Advanced topics, research and preparation for Model United Nations activities. Consent of instructor required. Restricted to: Main campus only.

**Prerequisite(s):** GOVT 313, minimum GPA 2.5.

**GOVT 315. Politics and Film****3 Credits**

Exploration of political themes, images, and representation in film and other media. May be repeated for a maximum of 6 credits under different subtitles.

**GOVT 320. Domestic Policy****3 Credits**

The course examines how U.S. public policy is made, including the players, politics, issues and power critical to the policy process. An interactive class that bridges theory and political action. Restricted to: Main campus only.

**GOVT 321. Topics in Public Policy****3 Credits**

Course examines issues in public policy. May be repeated under different subtitles.

**GOVT 324. Environmental Policy****3 Credits**

This introductory course explores environmental policy issues. Students study perspectives of policy-makers, political activists and policy analysts, and apply policy models to solve pressing environmental problems. Focus may be on U.S. or global concerns.

**GOVT 325. Education Policy and Politics****3 Credits**

Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy as the main approach.

**GOVT 330. Introduction to Public Administration****3 Credits**

What is public administration? Course examines public service, focusing on federal and state government. Issues include management and leadership, personnel, bureaucratic politics, organizational theory, personnel, budgeting and administrative law. Restricted to: Main campus only.

**GOVT 331. Special Topics in Public Administration****3 Credits**

Special topics in public administration. May be repeated for a maximum of 6 credits under different subtitles.

**GOVT 335. Management of Nonprofit Organizations****3 Credits**

This course provides an overview of a range of nonprofit management concerns and practices. Students will be challenged to assess their own theories of nonprofit accountability and excellence, while confronting critical issues facing the sector. Activities are designed to expand the management skills of students by offering analytical tools and knowledge, and providing opportunities to test the application of these skills.

**GOVT 343. Congress and the Legislative Process****3 Credits**

This class reviews the history, structure, membership, operation, power and culture of the American Congress. Restricted to: Main campus only.

**GOVT 344. The American Presidency****3 Credits**

A comprehensive overview of the U.S. presidency, including powers, electoral politics, decision-making styles, domestic and foreign policy, and relations with Congress, courts, media and interest groups.

**GOVT 345. The Supreme Court****3 Credits**

This class studies the history and operation of the Supreme Court, as well as landmark cases that have shaped American government and the Court.

**GOVT 348. Political Parties and Interest Groups****3 Credits**

Organization, principles, and functions of political parties and interest groups in the U.S.

**GOVT 350. Special Topics in American Government****3 Credits**

Special topics in American government. May be repeated for a maximum of 6 credits under different subtitles.

**GOVT 353. Women, Politics and Administration****3 Credits**

An examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Also explores the influence of feminism in changing women's roles socially, legally, and politically. Crosslisted with: W S 453

**GOVT 354. American Indian Politics****3 Credits**

Introduction to American Indian tribal governments, politics, policy, and administration; historical and contemporary leadership of Indian Nations; and the history and current status of American Indian-U.S. relations. Students learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization. Restricted to: Main campus only.

**GOVT 360. International Relations****3 Credits**

Introduction to world politics; fundamental international issues and problems.

**GOVT 361. Special Topics in International Relations****3 Credits**

Course examines contemporary issues in international relations. May be repeated under different subtitles.

**GOVT 362. International Political Economy****3 Credits**

Political factors in international economic relations; theories of political economy.

**GOVT 366. American Foreign Policy****3 Credits**

Formulation, content and rationale of current foreign policies of the U.S.

**GOVT 367. Terrorism****3 Credits**

An introductory course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism.

**GOVT 368. Fundamentals of Intelligence Studies****3 Credits**

Introductory survey of the major theoretical approaches and substantive issues in intelligence studies.

**GOVT 370. Comparative Politics****3 Credits**

Introduction to functional approaches to comparing similarities and differences among political systems.

**GOVT 371. Latin American Politics****3 Credits**

Basic structure of politics in major Latin American countries; role of groups, including church, labor, and parties.

**GOVT 372. Special Topics in Comparative Politics****3 Credits**

Course examines contemporary issues in comparative politics. May be repeated under different subtitles. Restricted to: Main campus only.

**GOVT 373. Resistance Movements in World Politics****3 Credits**

Research on violent and non-violent resistance movements around the world. Focus on their origins, demands, ideologies, strategies and impacts in the post-Cold War context of economic globalization, US military power and new geopolitical dynamics.

**GOVT 375. Self Determination and Minority Rights****3 Credits**

Comparative study of ethnic relations, minority rights, identity, citizenship and political representation.

**GOVT 378. U.S.-Mexico Border Politics****3 Credits**

Comparative perspectives applied to the problems of the U.S.-Mexican border.

**GOVT 379. Mexican Politics****3 Credits**

Introduction to the politics and government of contemporary Mexico.

**GOVT 380V. Contemporary World Political Ideologies****3 Credits**

Introduction to the prevailing political ideologies in the modern world and the ways in which modern nations operating under one or more of these ideologies attempt to answer fundamental questions about the allocation and distribution of rights, liberties, and other things of value. In addition, the course work and discussions attempt to address recent political, social, and economic events in various areas of the world.

**GOVT 382. Classical Political Thought****3 Credits**

Analysis of main currents in political thought from ancient Greece and Rome to the high Middle Ages.

**GOVT 383. Modern Political Thought****3 Credits**

Historical and theoretical examination of political ideas and ideologies from Machiavelli to Nietzsche. Topics include liberalism, conservatism, romanticism, communism, and Nihilism.

**GOVT 384. Contemporary Political Thought****3 Credits**

Examination of major currents in political theory from early twentieth century to the present. Includes positivism, fascism, neo-liberalism, and varieties of postmodernism.

**GOVT 385. American Political Thought****3 Credits**

Introduction to major American thinkers and historical currents from colonial time to the present.

**GOVT 386. Political Economy****3 Credits**

Analysis of political ideas concerning the role of the state in management of national economies, in both European and American contexts.

**GOVT 387. Religion and Politics****3 Credits**

Survey of major points of interaction between politics and religion in the U.S., using theoretical, historical, and institutional analysis.

**GOVT 390. Special Topics in Public Law****3 Credits**

Course examines various issues in public law. May be repeated under different subtitles.

**GOVT 391. Constitutional Law****3 Credits**

The class explores the reasoning and political context of the Supreme Court cases that define the distribution and limits of governmental powers and duties under the U.S. Constitution, including separation of powers and federalism. Restricted to: Main campus only.

**GOVT 392. Civil Liberties****3 Credits**

The course examines the reasoning and political context of major Supreme Court cases defining constitutional rights of free speech, religious liberty, free press and criminal procedural rights.

**GOVT 394. Judicial Process****3 Credits**

Class examines the structure, function and purpose of the American judicial system. Restricted to: Main campus only.

**GOVT 395. Law and Society****3 Credits**

Class critically explores the development, role and impact of law on our society, covering different theories of law, conceptions of justice and the values they reflect. These models are then applied to current legal issues. Not a class in legal reasoning, but one where students evaluate their beliefs about the legal system. Restricted to: Main campus only.

**GOVT 396. International Law****3 Credits**

Nature, growth, and scope of law of nations, rights and obligations of states in peace and war, current issues.

**GOVT 399. New Mexico Law****3 Credits**

New Mexico legal system, court structure and procedures; legal terms and concepts; constitutional, criminal, mass media, historical and social issues relating to New Mexico. Same as C J 399, HIST 399, JOUR 399, and SOC 399.

**GOVT 405. Directed Readings****1-3 Credits**

Individualized readings. Course subtitled. May be repeated for a maximum of 6 credits. Graded S/U. Consent of instructor required.

**GOVT 406. Independent Study****1-3 Credits**

Individualized research. Course subtitled. May be repeated for a maximum of 6 credits. Consent of instructor required.

**GOVT 407. Workshop****1-6 Credits**

Focus on skills related to careers in government and political science. Specific topics announced in the Schedule of Classes; may be repeated for a total of 6 credits. Only 3 credits apply toward government major or minor requirements. Graded S/U.

**GOVT 410. Internship****1-12 Credits**

Hands-on experience working with public agencies, political campaigns, elected officials & non-profits. May be repeated for a maximum of 12 credits; only 3 credits apply toward government major or minor requirements. Consent of instructor required. Graded: S/U.

**Prerequisite(s):** Completion of 12 government credits, 2.5 GPA, junior and above standing.

**GOVT 411. Service Learning Experience****3 Credits**

Experiential learning through a community service project. May be subtitled to reflect service activity. May be repeated for a total of 6 credits; only 3 credits apply toward government major or minor requirements.

**Prerequisites:** completion of 12 government credits, junior or above standing, and consent of instructor.

**GOVT 412. Practicum in Student Government****3 Credits**

Research of issues in student government. Consent of instructor required. Graded: S/U.

**Prerequisite(s):** Student government participation, completion of 12 GOVT credits, junior or senior standing.

**GOVT 415. Senior Seminar****2 Credits**

Review and integration of political skills acquired in the Government Department. Students will prepare a professional portfolio for entry into the workforce, advanced study, and civic participation. S/U Grading (S/U, Audit).

**GOVT 465. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as ANTH 459 and HIST 459.

**GOVT 468. Rebels, Guerrillas, and Terrorists in Modern Latin America****3 Credits**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Columbia's FARC, and Mexico's Zapatistas. Same as HIST 331.

**GOVT 469. Globalization****3 Credits**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOC 489.

**GOVT 474. European Politics****3 Credits**

Politics in European countries, European integration, post-communist states, regionalism and border politics.

**GOVT 493. Mass Communications Law****3 Credits**

Same as JOUR 493 and COMM 493.

**GOVT 502. Research Methods in Government****3 Credits**

Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications. MPA students must complete this class with a B- or better. MA students must complete either GOVT 502 or GOVT 503 with a B- or better.

**GOVT 503. Qualitative Research Methods****3 Credits**

An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology (the study of knowledge) and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects. MA students must complete either GOVT 503 or GOVT 502 with a B- or better.

**GOVT 505. Directed Readings****1-3 Credits**

Selected topics in government. May be repeated for a total of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**GOVT 510. Internship****1-6 Credits**

Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U.

**Prerequisite:** approval of graduate advisor.

**GOVT 517. Selected Topics in Government****3 Credits**

Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.

**GOVT 519. Proseminar in Public Administration****3 Credits**

Review of classic and contemporary theory and practice in public administration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. To be completed with a B- or better.

**Prerequisite(s):** 30 credits of M.P.A.

**GOVT 522. Public Sector Economics I****3 Credits**

Same as AEEC 522.

**GOVT 523. Public Sector Economics II****3 Credits**

Same as AEEC 523.

**GOVT 527. Issues in Public Management****3 Credits**

Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.

**GOVT 530. Seminar in Public Policy****3 Credits**

Survey of the political, administrative, and technical aspects of policy making in government. MA students taking GOVT 530 as part of their core requirements must complete the class with a B- or better.

**GOVT 535. Education Policy and Politics****3 Credits**

Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy the main approach.

**GOVT 536. Public Policy and Indigenous Communities****3 Credits**

Indigenous communities are found throughout North, Central and South America. This course addresses the history, development and governance of these communities. Different sections of the course may choose to focus on different indigenous communities. All courses will consider the principles of governance internal to indigenous communities as well as the governing relationships between indigenous communities and modern states.

**GOVT 537. Issues in Public Policy****3 Credits**

Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.

**GOVT 540. Seminar in Public Administration****3 Credits**

Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector. MA students taking Govt 540 as part of their core requirements must complete the class with a B- or better.

**GOVT 541. Public Budgeting****3 Credits**

Budgetary processes; budget classification, analysis, and evaluation. MPA students must complete this class with a B- or better.

**GOVT 542. Public Sector Human Resources Management****3 Credits**

Exploration of public personnel systems and practices, including job analysis, compensation, performance evaluation, recruitment, and labor-management relations. MPA students must complete this class with a B- or better.

**GOVT 543. Skills Workshop****1-6 Credits**

Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes; may be repeated for a total of 6 credits.

**GOVT 544. Public Policy Analysis****3 Credits**

Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. MPA students must complete this class with a B- or better.

**Prerequisite(s):** GOVT 502 or consent of instructor.

**GOVT 547. Government Organizations****3 Credits**

Historical overview and present applications of organization theory in public management. MPA students must complete this class with a B- or better.

**GOVT 548. Public Sector Leadership****3 Credits**

Theories and styles of leadership.

**GOVT 549. Ethics in Government****3 Credits**

Examination of standards, perspectives, and issues for ethical decision-making in public agencies. MPA students must complete this class with a B- or better.

**GOVT 550. Seminar in American Politics****3 Credits**

Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation. MA students taking Govt 550 as part of their core requirements must complete the class with a B- or better.

**GOVT 560. Seminar in International Relations Theory****3 Credits**

A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics. MA students taking Govt 560 as part of their core requirements must complete the class with a B- or better.

**GOVT 561. Nations and Soft Power****3 Credits**

Course employs historical, theoretical and practical "best/worst practices" lenses to deal with key questions, such as how do the US and other states present themselves to the world? What are "soft power" and "national reputation management"? How does one build or damage a country's image and "brand"? What are "public diplomacy" and "cultural diplomacy", and how do they factor into the foreign relations of the US and other states?

**GOVT 563. Issues in International Relations****3 Credits**

Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.

**GOVT 564. Advanced National Security Policy****3 Credits**

Major topical, theoretical, and regional issues in national security policy.

**GOVT 569. Advanced Issues in Globalization****3 Credits**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOC 589.

**GOVT 570. Seminar in Comparative Politics****3 Credits**

Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries. MA students taking Govt 570 as part of their core requirements must complete the class with a B- or better.

**GOVT 574. Contemporary Comparative Studies****3 Credits**

Major topical, theoretical, and regional issues in international politics. May be repeated once.

**GOVT 578. Seminar in the U.S.-Mexican Border****3 Credits**

An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.

**GOVT 579. Seminar in Mexican Politics****3 Credits**

Advanced research on politics and government of Mexico.

**GOVT 580. Seminar in Political Theory****3 Credits**

Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter. MA students taking GOVT 580 as part of their core requirements must complete the class with a B- or better.

**GOVT 587. Seminar in Religion and Politics****3 Credits**

Historical, theoretical and comparative analyses of the interaction between politics and religion.

**GOVT 590. Seminar Public Law and Legal Systems****3 Credits**

Focus on U.S. Constitutional Law and other national legal systems. MA students taking Govt 590 as part of their core requirements must complete the class with a B- or better.

**GOVT 591. Law for Administrators****3 Credits**

Case-law definitions of the legal roles and powers of public administrators.

**GOVT 593. Issues in Public Law****3 Credits**

Selected issues in public law. May be repeated under a different subtitle for a total of 6 credits.

**GOVT 596. International Law****3 Credits**

Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.

**GOVT 598. Special Research Programs****1-3 Credits**

Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.

**GOVT 599. Master's Thesis****1-15 Credits**

Thesis.

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## Government - Bachelor of Arts Departmental Requirements

GOVT 100G	American National Government	3
or HON 249G	American Politics in a Changing World	
GOVT 101	Introductory Government Seminar	1
GOVT 110G	Introduction to Political Science	3
or HON 248G	The Citizen and the State: Great Political Issues	
GOVT 300	Political Research Skills	3
or	Another social science research methods course <sup>2</sup>	
<i>Select one upper-division course from four of six subfields:</i>		12
Public Administration and Policy (GOVT 20/30 series)		
American Government and Politics (GOVT 40/50 series)		
International Relations (GOVT 60 series, may include HON 304V)		
Comparative Politics (GOVT 70 series may include HON 307V)		
Political Theory GOVT 80 series may include GOVT 380V)		
Public Law (GOVT 90 series)		
GOVT 415	Senior Seminar (take in final year)	2
<i>Electives</i>		
Select additional credits in government to bring total credits in major to 33, including 20 upper-division.		9
Total Credits		33

<sup>1</sup> Majors should complete these lower level requirements before registering for upper-division government credits.

<sup>2</sup> A list of approved options is available in the department office.

## Degree Requirements

General Education Courses	35
Viewing a Wider World Courses	6
Departmental Requirements (listed above):	33
Second Language Requirement: (required- see below)	3
Electives: to bring total to 120, of which 48 credits are upper-division	43
Total Credits	120

*Note: Students may not count S/U grades taken in their major unless the particular course is regularly graded S/U. All courses must be passed with grades of C- or better. In addition, while research methods courses taken outside of the department may count toward the methods requirement, only GOVT 300 Political Research Skills counts toward the 33 credits in the major.*

Up to twelve hours of internship credit are available. However, only three hours count toward the major. Internship guidelines are available in the department office and on the Government Department web page, <http://deptofgov.nmsu.edu/>.

## Second Language Requirement

For the Bachelor of Arts in Government there is a two year second language requirement, the student must do one of the following:

### Option 1:

Complete one of the following sequences:

CHIN 111 & CHIN 112 & CHIN 211 & CHIN 212	Elementary Chinese I and Elementary Chinese II and Intermediate Chinese I and Intermediate Chinese II	14
FREN 111 & FREN 112 & FREN 211 & FREN 212	Elementary French I and Elementary French II and Intermediate French I and Intermediate French II	14
GER 111 & GER 112 & GER 211 & GER 212	Elementary German I and Elementary German II and Intermediate German I and Intermediate German II	14
JPNS 111 & JPNS 112 & JPNS 211 & JPNS 212	Elementary Japanese I and Elementary Japanese II and Intermediate Japanese I and Intermediate Japanese II	14
SPAN 111 & SPAN 112 & SPAN 211 & SPAN 212	Elementary Spanish I and Elementary Spanish II and Intermediate Spanish I and Intermediate Spanish II	14
PORT 213 & PORT 214	Portuguese for Romance Language Students I and Portuguese for Romance Language Students II	6

*For Heritage Speakers:*

SPAN 113 & SPAN 213 & SPAN 214	Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	9
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### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3
C D 476	American Sign Language III	3

### Option 3:

Challenge the 212 level for the following courses:

CHIN 212	Intermediate Chinese II	3
or FREN 212	Intermediate French II	
or GER 212	Intermediate German II	
or JPNS 212	Intermediate Japanese II	

or SPAN 212	Intermediate Spanish II	
OR		
<b>Challenge the 214 level for the following courses:</b>		
PORT 214	Portuguese for Romance Language Students II	3
or SPAN 214	Spanish for Heritage Learners III	

### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## American Government and Politics - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G	American National Government	3
or HON 249G	American Politics in a Changing World	
GOVT 110G	Introduction to Political Science	3
or HON 248G	The Citizen and the State: Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## Comparative Politics - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G or HON 249G	American National Government American Politics in a Changing World	3
GOVT 110G or HON 248G	Introduction to Political Science The Citizen and the State: Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## Government - Undergraduate Minor

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G or HON 249G	American National Government American Politics in a Changing World	3
GOVT 110G or HON 248G	Introduction to Political Science The Citizen and the State: Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from different subfields.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## International Relations - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G or HON 249G	American National Government American Politics in a Changing World	3
GOVT 110G or HON 248G	Introduction to Political Science The Citizen and the State: Great Political Issues	3

Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.	12
Total Credits	18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## Political Theory - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G or HON 249G	American National Government American Politics in a Changing World	3
GOVT 110G or HON 248G	Introduction to Political Science The Citizen and the State: Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## Public Administration - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G or HON 249G	American National Government American Politics in a Changing World	3
GOVT 110G or HON 248G	Introduction to Political Science The Citizen and the State: Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## Public Law - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Code	Title	Credits
<b>Required Courses</b>		
GOVT 100G or HON 249G	American National Government American Politics in a Changing World	3
GOVT 110G or HON 248G	Introduction to Political Science The Citizen and the State: Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HON 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including GOVT 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

## Law and Society - Supplemental Major

The Department of Government also coordinates a supplementary major in law and society that may be taken in addition to a regular major. The program is designed to allow students to combine law-related classes offered across a range of departments and disciplines. It is of particular interest to undergraduates interested in law school or who contemplate careers in fields closely related to the legal profession, such as government, politics, social work or law enforcement.

## Requirements

The supplementary major consists of 24 credits chosen from the courses listed below. At least 18 credits must be earned in upper-division courses and 6 credits must be earned from listed courses outside the student's primary major. Candidates for the Law and Society degree must declare their supplementary major prior to completing the last 9 credits of the program.

### Core Courses

Select three from the following:		9
C J 205	Criminal Law	
GOVT 395	Law and Society	
GOVT 391	Constitutional Law	
GOVT 394	Judicial Process	
C J 306	Criminal Procedural Law	

or GOVT 392 Civil Liberties  
or JOUR 493/ Media Law  
HON 377V

### Communication Skills

Select one from the following:		3
COMM 351	Persuasion Theory and Practice	
ENGL 311G	Advanced Composition	
PHIL 448	Writing Philosophy	

### Critical Thinking Skills

Select one from the following:		3
GOVT 382	Classical Political Thought	
PHIL 211G	Informal Logic	
PHIL 312	Formal Logic	

### Jurisprudence

Select one from the following:		3
C J 307	Law of Evidence	
C J 424	Forensic Law	
GOVT 385	American Political Thought	
PHIL 376	Philosophy of Law	
PSY 330	Psychology and the Law	
SOC 391	Crime and Society	

### Legal Policy Issues

Select two from the following:		6
BLAW 316	Legal Environment of Business	
BLAW 385V	Consumers and the Law	
C J 250	Courts and the Criminal Justice System	
C J 332	Correctional Law	
C J/GOVT/ JOUR/HIST 399	New Mexico Law	
GOVT 345	The Supreme Court	
GOVT 387	Religion and Politics	
GOVT 390	Special Topics in Public Law	
GOVT 396	International Law	
HON 335V	Legal Issues in Modern Society	
HRTM 304	Hospitality and Travel Law	
PHIL 100G	Philosophy, Law and Ethics	
PHIL 320	Social and Political Philosophy	
SOC 392	Juvenile Delinquency	

Total Credits 24

## Government - Master of Arts

The MA program provides general course work in each of the major fields of political science. Students may choose either the thesis option, under which they complete 30 credits of course work plus 6 thesis credits (GOVT 599 Master's Thesis), or the nonthesis option, with 30 credits of course work plus 6 hours of special research credit (GOVT 598 Special Research Programs) or 6 hours of approved internship credit (GOVT 510 Internship). Both the thesis and nonthesis options require a final oral examination; the non thesis option requires a written examination as well. The program provides a broad-based foundation in political science while allowing students to pursue specific areas of interest.

## Requirements

Flexibility in planning a program of study is permitted to meet the educational needs of a diverse student population. Structured areas of emphasis are available in several topical areas, including Latin American and international affairs. Students may also take a graduate minor in Security Studies. Information on these areas and the graduate minor may be obtained from the Department of Government. No more than 9 credits taken outside the department will be counted toward the degree.

### Requirements

GOVT 502	Research Methods in Government	3
or GOVT 503	Qualitative Research Methods	
Select three from the following:		9
GOVT 530	Seminar in Public Policy	
GOVT 550	Seminar in American Politics	
GOVT 560	Seminar in International Relations Theory	
GOVT 570	Seminar in Comparative Politics	
GOVT 580	Seminar in Political Theory	
GOVT 590	Seminar Public Law and Legal Systems	
Additional credits subject to advisor approval <sup>1</sup>		18
<b>Thesis/Non-Thesis</b>		
Select one from the following:		6
GOVT 599	Master's Thesis	
GOVT 598	Special Research Programs	
or GOVT 510	Internship	
Total Credits		36

<sup>1</sup> The remaining credits required for the degree are selected subject to advisor approval to satisfy particular academic interests or career goals.

## Public Administration - Master of Public Administration

The MPA program is accredited by NASPAA. The MPA is designed to provide students with the managerial and analytical skills, in addition to ethical and professional values, necessary to meet the increased demand for skilled public administrators. Candidates who follow this professional program must complete a minimum of 42 credits, consisting of core courses, electives and either an internship or a thesis.

### Requirements

Because students have divergent career goals, a thesis or internship option is offered. The thesis option requires an additional 18 credits of course work, 6 credits of thesis (GOVT 599 Master's Thesis), and a written examination covering the thesis and course work. The internship option also requires an additional 18 credits of course work, 3 credits of internship (GOVT 510 Internship), and a written examination covering the internship and course work. Students who fail their written examination must take an oral exam. As part of the course work, students selecting the internship option must take GOVT 519 Proseminar in Public Administration (3 credits that count toward the 42 total) during the latter part of their studies, and are required to earn a B- grade or higher in that course.

With approval, students may include up to 12 credits of relevant course work from other departments to be counted toward the total credits required for the MPA. These credits may be selected to form a graduate minor in another academic discipline.

### Core Courses

GOVT 502	Research Methods in Government	3
GOVT 541	Public Budgeting	3
GOVT 542	Public Sector Human Resources Management	3
GOVT 544	Public Policy Analysis	3
GOVT 547	Government Organizations	3
GOVT 549	Ethics in Government	3

### Thesis Option

Select one from the following: 24

#### Thesis

GOVT 599 Master's Thesis (6 credits)

Select 18 credits of additional course work

#### Internship and Capstone Option 2

GOVT 510 Internship (3 credits)

Select 18 credits of additional course work

GOVT 519 Proseminar in Public Administration (3 credits)

Total Credits 42

Candidates with inadequate preparation for graduate study in public administration may be required to take appropriate undergraduate and graduate courses as part of, or in addition to, a regular program of study. Applicants to the MPA program will be advised of any such requirements at the time of admission.

## MPA-MA Public History Program - Dual Degree

The MPA-MA Public History Option Program requires completion of a minimum of 57 credits of approved course work from the Departments of Government and History, including completing internship credits in both programs. Interested applicants should consult with the MPA director or the director of the Public History Program for additional information.

## MPA-MCJ Program - Dual Degree

The MPA-MCJ joint degree option requires completion of a minimum of 57 credits of approved course work from the Departments of Government and Criminal Justice. Students interested in this option should meet with the MPA director or criminal justice graduate advisor for additional information.

## Security Studies - Graduate Minor

### Requirements

Select three from the following:		9
GOVT 468	Rebels, Guerrillas, and Terrorists in Modern Latin America	
GOVT 549	Ethics in Government	
GOVT 560	Seminar in International Relations Theory	

GOVT 561	Nations and Soft Power
GOVT 564	Advanced National Security Policy
GOVT 569	Advanced Issues in Globalization
GOVT 574	Contemporary Comparative Studies
GOVT 596	International Law
Total Credits	9

## Additional Courses

Other graduate courses may become available during the year which may be substituted for the above listed courses. Consideration may be made on a case-by-case basis.

## History

### Undergraduate Program Information

An undergraduate degree in history prepares students for careers in: teaching; law; public service; management; journalism; education; communications; travel counseling; and library, museum and archival staff work. Students master skills including the ability to read critically, to formulate arguments, to conduct historical research, and to synthesize arguments and create novel interpretations.

### Graduate Program Information

The Department of History offers graduate work leading to the Master of Arts degree. In addition to fulfilling the basic requirements for admission to the Graduate School, applicants must present undergraduate passage of at least 12 credits in history with grades of B or higher, including 6 upper division history credits. Those lacking this preparation must normally make up deficiencies before beginning graduate course work. Candidates who choose a course of study requiring a foreign language will be responsible for their own language preparation.

Students applying for admission to the graduate program in history are required to submit an application form and a transcript to the Graduate School and a strong writing sample, three letters of recommendation ideally from History faculty members at NMSU or other institutions, and a two-to-three page statement of purpose to the Department of History, approximately four months in advance of the desired enrollment date. Applicants for graduate assistantships and fellowships must submit a letter of application, a transcript, and three letters of recommendation to the department by February 15 for the fall semester, and by October 15 for the spring semester. Students who are not applying for graduate assistantships and fellowships may apply at any time for acceptance into the graduate program.

## Degrees for the Department

History - Bachelor of Arts (p. 335)

History - Master of Arts (p. 336)

Public History and Public Administration - Joint M.A. Degree (p. 326)

## Minors for the Department

History - Undergraduate Minor (p. 336)

History - Graduate Minor (p. 337)

**Professors** Bronstein, Cioc-Ortega, Garcia-Bryce, Hammond, Horodowich, Hunner, Malamud **Associate Professors** Brooks, Kopp, Orzoff; **College Professors** E. Masson, Tollefson; Pitcaithley, Schneider- Hector

*J. L. Bronstein, Ph.D. (Stanford)– U.S., Britain; N. M. Brooks, Ph.D. (Columbia)– Russia/Soviet Union, modern Europe, modern science; M. Cioc-Ortega, Ph.D. (California-Berkeley)- Europe, US, public history; I. Garcia-Bryce, Ph.D. (Stanford)– Latin America, Peru; K. J. Hammond, Ph.D. (Harvard)– China, East Asia; E. Horodowich, Ph.D. (Michigan-Ann Arbor)– early modern Europe, Mediterranean; J. Hunner, Ph.D. (New Mexico) public history, New Mexico; P. Kopp, Ph.D. (Nevada-Reno)- US, environmental, public history; M. Malamud, Ph.D. (California-Berkeley)– ancient, medieval, Islam; A. Orzoff, Ph.D. (Stanford)– twentieth-century Europe, Eastern Europe, intellectual history.*

### History Courses

#### HIST 101G. Roots of Modern Europe

##### 3 Credits

Economic, social, political, and cultural development from earliest times to about 1700.

#### HIST 102G. Modern Europe

##### 3 Credits

Economic, social, political, and cultural development from 1700 to the present.

#### HIST 110G. Making History

##### 3 Credits

General introduction to history: how historians carry out research and develop interpretations about the past.

#### HIST 111G. Global History to 1500

##### 3 Credits

Global economic, social, political and cultural developments to 1500. Thematic approach.

#### HIST 112G. Global History Since 1500

##### 3 Credits

Global economic, social, political and cultural developments since 1500. Thematic approach.

#### HIST 201G. Introduction to Early American History

##### 3 Credits

History of the United States to 1877, with varying emphasis on social, political, economic, diplomatic, and cultural development.

#### HIST 202G. Introduction to Recent American History

##### 3 Credits

History of the United States since 1877, with varying emphasis on social, political, economic, diplomatic, and cultural development.

#### HIST 211G. East Asia to 1600

##### 3 Credits

History of China, Korea, Vietnam, and Japan from earliest times through the sixteenth century. Emphasis on cultural and political developments and their social and economic contexts, and the interaction between East Asian societies.

#### HIST 212G. East Asia since 1600

##### 3 Credits

History of China, Korea, Vietnam, and Japan from the sixteenth through the twentieth centuries. Emphasis on internal development of each country, as well as the social and political impact of Western Imperialism, and the emergence of each country's unique version of modern society.

**HIST 221G. Islamic Civilizations to 1800****3 Credits**

History of Islamic civilizations to 1800.

**HIST 222G. Islamic Civilizations since 1800****3 Credits**

History of Islamic civilizations since 1800.

**HIST 261. New Mexico History****3 Credits**

Economic, political, and social development of New Mexico from exploration to modern times. Community Colleges only.

**HIST 269. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

**HIST 300. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

**HIST 302V. Science in Modern Society****3 Credits**

The social impact of scientific activity and thought from Newton to the present. The growth of modern scientific institutions; the political and social context of modern science. ENGL 111G recommended.

**HIST 304. The Global Cold War****3 Credits**

Survey of the global history of the Cold War. The emergence of the USSR and US as global superpowers, their involvement in the end of the European great-power empire, the rise of petropolitics and the nuclear era, modern terrorism, and the creation of the First, Second and Third Worlds all have their roots in the Cold War. Although the Iron Curtain ran through Europe, with the Berlin Wall considered its main front, the Cold War's impact was not limited to Europe. Proxy wars were fought all over the world; the globe became a set or arenas of contestation. Students will carefully read historical documents as well as textbooks and literary works; in addition to close analysis of different kinds of sources, we will explore different kinds of historical writing.

**HIST 311V. Colonial Latin America****3 Credits**

Social, political, and economic development from Columbus to the Wars of Independence. Research paper required.

**HIST 312V. Modern Latin America****3 Credits**

Post-revolutionary developments in the nineteenth and twentieth centuries; the role of Latin America in world affairs and the Inter-American system. Research paper required.

**HIST 313. Making the American West****3 Credits**

Development of the American West from 1803 to 1900 with emphasis on conquest, federal and corporate roles in western development, environmental change, and the Mythic West. Includes meetings outside regular class time to view feature-length films.

**HIST 315. From the Wild West to the Atomic West****3 Credits**

Explores the transformation of the West with particular attention to the roles of race, class, gender and culture. Includes meetings outside regular class time to view feature-length films.

**HIST 316. History of Women in the American West****3 Credits**

Experiences and interactions among Native American, Spanish/Mexican, immigrant, and Anglo-American women in the American West from 1500 to the present. Same as WS 316.

**HIST 321. History of Korea****3 Credits**

Social, political, and cultural history of Korea from earliest times through twentieth century. Emphasis on the interaction between Korean traditions and influences from China and the West.

**HIST 323. Cultural History of Later Imperial China****3 Credits**

Covers art and literature of China from the Tang Dynasty (618-907) through the eighteenth century. Developments in cultural theory and practice are traced in the context of the social and economic changes fostering an understanding of Chinese cultural history and its legacy in East Asia today.

**HIST 323 L. Splendor of Imperial China****1 Credit**

This course consists of a FLIP trip to China, Spring 2014 which will explore the significant sites of imperial Chinese culture by spending 14 days traveling in China. Crosslisted with: ART 311 L and HIST 323.

**HIST 329. History of Egypt****3 Credits**

History of Egypt from ancient times to the present.

**HIST 330V. Introduction to Religious Studies****3 Credits**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. Same as SOC 330V and ANTH 330V.

**HIST 331. Rebels, Guerrillas, and Terrorists in Modern Latin America****3 Credits**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Colombia's FARC, and Mexico's Zapatistas. Same as GOVT 468.

**HIST 334. Art and Life in Renaissance Italy****3 Credits**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ART 444.

**HIST 338. World War I****3 Credits**

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war.

**HIST 339. World War II****3 Credits**

Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement.

**HIST 340. American Economic History****3 Credits**

The rise of big business and organized labor, increasing price rigidities, and growing government intervention. Same as ECON 340.

**HIST 342. Early American Military History****3 Credits**

Emphasis on American wars up to and including the Civil War, and on the factors contributing to the development of modern military systems.

**HIST 343. Recent American Military History****3 Credits**

Emphasis on American wars since the Civil War, and on factors contributing to the development of modern military systems.

**HIST 346. The Jacksonian Era 1800-1840****3 Credits**

Jeffersonian period, War of 1812. Social, political, and economic history of the Jacksonian era.

**HIST 347. Civil War Era 1840-1877****3 Credits**

Mexican-American War, development of secession, American Civil War, Reconstruction.

**HIST 353. Colonial Mexico****3 Credits**

Covers major social, political, economic and cultural topics including pre-Columbian civilizations, early European incursions and indigenous responses, economic systems and labor exploitation, religion and spirituality, and resistance to colonial rule. Sixteenth to nineteenth centuries.

**HIST 354. Modern Mexico****3 Credits**

Examines interactions of peasants, women, indigenous peoples, and economically/politically dominant groups within the Mexican state from 1810 to the present. Assesses the contentious relationship between Mexico and the United States, focusing on the Mexican-U.S. border.

**HIST 356. The Mexican Revolution****3 Credits**

Examines the history of modern Mexico through the lens of the Mexican Revolution, 1910-1920. Course covers military, political, social, cultural and economic developments that shaped Mexico during and after the Revolution.

**HIST 361. Afro-American History I****3 Credits**

African background, slave trade, slavery; Civil War and Reconstruction; free blacks in a white society to about 1900.

**HIST 362. Afro-American History II****3 Credits**

Black Americans in the United States in the twentieth century; segregation; black leaders, organizations, methods and goals; white reaction; the struggle for equality.

**HIST 366V. British Imperialism****3 Credits**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

**HIST 368. Teaching History****3 Credits**

Philosophical and practical issues of teaching history are explored. Designed to help prospective teachers at all levels clarify their views about studying history. A variety of pedagogical strategies for teaching history are explored.

**HIST 369. History of Latinos in the United States****3 Credits**

Development of Latino communities since 1500 in what is today the U.S. Emphasis on 1846 to present, and on Mexican Americans, Puerto Ricans, and Cuban Americans. Major themes: race, colonialism, immigration, nationalism, class, culture, gender, and politics.

**HIST 371. Ancient Greece****3 Credits**

Social, cultural, and political history of Greece from the Minoan to Hellenistic periods.

**HIST 372. The Roman World****3 Credits**

Republic and Empire; Rome as a world power; institutional, cultural, and intellectual contributions; decline and fall.

**HIST 373. Islam and the West: Cultural Contacts, Conflicts and****Exchanges****3 Credits**

Examines interactions, encounters and cross-fertilization between the Islamic world and the West from the seventh to the twenty-first centuries. Course includes origins of Islam, relationships between Islam, Judaism, and Christianity, and concludes with the post 9/11 present.

**HIST 374V. The European City: History and Culture****3 Credits**

Course presents the rich, complex history and cultures of European cities from ancient to modern times, linking these cities to crucial issues in European history. Crosslisted with HON 374V, GEOG 374V, GOVT 374V.

**HIST 376. Great Battles That Shaped Europe****3 Credits**

Considers the most significant battles in the West from the 13th century BCE (Troy) to the 16th century CE (Spanish Armada).

**HIST 382V. Modern Russia****3 Credits**

Domestic policies and foreign relations from mid-nineteenth century to the present with emphasis on the Soviet period.

**HIST 383. Germany****3 Credits**

Political, social, and cultural developments from the eighteenth century to the present, with emphasis on the Nazi era. Same as GOVT 473.

**HIST 386. New Mexico History****3 Credits**

Economic, political and social development of New Mexico from exploration to modern times.

**HIST 387. Spain****3 Credits**

From pre-Roman times to the modern era.

**HIST 390V. The Holocaust****3 Credits**

The attack upon European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession to chancellor in 1933 until the end of the Third Reich in 1945.

**HIST 391. Twentieth Century World History****3 Credits**

Includes globalization; imperialism; World Wars I and II and the changing roles of Europe: the Cold War; decolonization; the rise and collapse of Communism; new social and intellectual movements; and the growing roles of East Asia, India, Latin America, Africa and the Middle East. Thematic examples.

**HIST 392. Tudor-Stuart England, 1485-1715****3 Credits**

British history from 1485-1715, including the development of the monarchy and Parliament, the Protestant Reformation, the English Civil War and Restoration, and culture and society.

**HIST 394. Victorian and Edwardian Britain, 1815-1914****3 Credits**

Evolution of constitutional monarchy; industrialism and imperialism; repose and reform; increased influence of an intellectual elite and the emergence of the Labor Party.

**HIST 395. From Rule Britannia to Cool Britannia: Twentieth-Century Britain****3 Credits**

Edwardian Era, World War I; Reconversion, the 1926 General Strike; the Great Depression and appeasement; Churchill and the war against Nazi Germany; nationalization and the Welfare State.

**HIST 397. Introduction to Public History****3 Credits**

Surveys how historians do history in museums, archives, government agencies, and in communities. Hands-on experience provides students a better understanding of history and how historians work outside of the classroom. Seminar project required.

**HIST 398. Historians and History****3 Credits**

General historiography and philosophy of history; historical methodology, research, and writing; bibliographical aids and their uses. May be repeated up to 3 credits. Restricted to: HIST majors.

**HIST 399. New Mexico Law****3 Credits**

Same as GOVT 399, C J 399, JOUR 399, and SOC 399.

**HIST 400. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

**HIST 402. Special Topics in European History****3 Credits**

Special topics in European history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 403. Special Topics in Middle Eastern History****3 Credits**

Special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 404. Special Topics in Asian History****3 Credits**

Special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 406. Special Topics in United States History****3 Credits**

Special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 408. Cultures of Africa****3 Credits**

Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that have shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental changes such as deforestation are discussed. Crosslisted with: ANTH 404

**HIST 410. New Mexico History for Educators****3 Credits**

Course provides content and innovative techniques for teachers of New Mexico history. Covers pre-contact Native American history through Spanish Colonial and Mexican periods through the twentieth century.

**HIST 411. Making the American West****3 Credits**

This seminar course explores the history of disease, dying, death and funeral practices, and may include such topics as the social and cultural histories of murder, suicide, epidemics, death in wartime, the death penalty, and/or the corpse. The class may be taught with a different national or chronological focus in different semesters. Crosslisted with: HIST 513.

**HIST 412. Travel Writing****3 Credits**

Explores how writers describe their travels with an emphasis on the history of a place. Semester paper required. Crosslisted with: HIST 512.

**HIST 413. Native American History****3 Credits**

Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

**HIST 417. The Mongol Empire****3 Credits**

Examines the history and legacy of the Mongol World Empire founded by Chinggis Khan and his sons, and the dynasties that came to dominate Inner Asia in its wake. Crosslisted with: HIST 517.

**HIST 419. Central Asia****3 Credits**

An introduction to the political, cultural and social history of the Central Asian region from pre-history to the present, including coverage of the empires of the Mongols, Tamerlane and their successors. Crosslisted with: HIST 519.

**HIST 423. The History of Food****3 Credits**

Considers the history of the production and consumption of food in the West from the Neolithic Age to the present with an emphasis on the historical relationships between food, gender, social class, social identity and nationalism. Crosslisted with: HIST 523.

**HIST 424. History of Art, Thought and Literature****3 Credits**

Seminar discusses a variety of artistic and literary expressions in their historical contexts and focuses on the ways in which cultural forms both reflect and construct the broader historical trends that surround them.

**HIST 425V. History of Magic and Witchcraft in Medieval and Renaissance Europe**

**3 Credits**

Examines history of popular and scientific beliefs about magic and witchcraft in medieval and early modern Europe. Includes origins of occult Western sciences; Arabic sources of medieval magic; the occult sciences in scholasticism; witchcraft and scholasticism; witchcraft and medieval theology, witch hunts of the 16th and 17th centuries; and the decline of belief in magic and witchcraft. Emphasis on boundaries that defined and separated magic, science, and religion in Western thought from late antiquity through the Scientific Revolution. Crosslisted with: HON 425.

**HIST 428. History of Terrorism in Modern Europe and the Middle East**

**3 Credits**

Analyzes causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas and Hezbollah in the contemporary Middle East and beyond.

**HIST 431. History of Race and Ethnicity**

**3 Credits**

Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.

**HIST 432. United States Labor History to 1877**

**3 Credits**

Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 433. United States Labor History Since 1877**

**3 Credits**

Seminar discussions explore United States labor and working-class history since 1877, including such topics as industrial labor, debt peonage, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 434. Urban History**

**3 Credits**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

**HIST 435. History of War and Revolution**

**3 Credits**

Seminar covers historical dynamics of violent social, political, and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

**HIST 436. Nations and Nationalism**

**3 Credits**

Seminar examines major theories of nationalism from the nineteenth century to the twenty-first century. Course includes nationalist case studies, from liberal nationalist state-building to ethnic cleansing in the Balkans.

**HIST 438. Antiquity and Modernity**

**3 Credits**

Seminar explores links between earlier and more recent historical periods. Examples may include the Renaissance rediscovery of ancient Rome or the early modern Chinese reassessment of its classical Confucian heritage. Readings include ancient sources and the modern reception of such works, and the scholarly assessment of these processes. Individual research projects required in areas of student interests.

**HIST 443. The Cold War in Latin America**

**3 Credits**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

**HIST 448. Nuclear Nation**

**3 Credits**

Explores post-World War II history and the impact atomic energy has had on the United States and the world.

**HIST 449. Readings**

**1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**HIST 453. Cuba: Colony to Castro**

**3 Credits**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean with emphasis on recent events.

**HIST 459. Peru: From Incas to Inca Kola**

**3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as ANTH 459 and GOVT 465.

**HIST 471. China through the Ming Dynasty**

**3 Credits**

History of China from origins to Ming dynasty, (1368-1644). Cultural and political development with emphasis on social and economic contexts and long term trends.

**HIST 472. China in the Modern World**

**3 Credits**

History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.

**HIST 473. History of Japan**

**3 Credits**

History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.

**HIST 474. Gender in East Asian History****3 Credits**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as W S 474.

**HIST 475. History of the Global Political Economy****3 Credits**

Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

**HIST 479. Oral History****3 Credits**

Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.

**HIST 481. Time Traveling Through New Mexico's Past****3 Credits**

Teaches historians and educators how to make history come alive. Semester project includes role playing characters and activities from a past era with local schools and museums.

**HIST 483. Historic Preservation****3 Credits**

Study of community development, the historic preservation movement, and the built environment. Field project.

**HIST 486. Interpreting Historic Places for the Public****3 Credits**

Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

**HIST 489. Projects in History****3 Credits**

Individual projects in history. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**HIST 500. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated for a maximum of 12 credits.

**HIST 503. The Jacksonian Era, 1800-1840****3 Credits**

Jeffersonian period, War of 1812. Social, political, and economic history of the Jacksonian era. Graduate research paper required.

**HIST 504. Civil War Era, 1840-1877****3 Credits**

Mexican-American War, development of secession, American Civil War, Reconstruction. Graduate research paper required.

**HIST 507. The History of Food****3 Credits**

Considers the history of the production and consumption of food in the West from the Neolithic Age to the present, with an emphasize on the historical relationships between food, gender, social class, social identity and nationalism. Crosslisted with: HIST 423.

**HIST 509. Native American History****3 Credits**

Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans, and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

**HIST 510. New Mexico History for Educators****3 Credits**

Course provides advanced content and innovative techniques for teachers of New Mexico history. Covers pre-contact Native American history through Spanish Colonial and Mexican periods through the twentieth century.

**HIST 511. Making the American West****3 Credits**

Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.

**HIST 512. Travel Writing****3 Credits**

Explores how writers describe their travels with an emphasis on the history of a place. Semester paper required. Crosslisted with: HIST 412.

**HIST 513. American Social and Cultural History to 1900****3 Credits**

This seminar course explores the history of disease, dying, death and funeral practices, and may include such topics as the social and cultural histories of murder, suicide, epidemics, death in wartime, the death penalty, and/or the corpse. The class may be taught with a different national or chronological focus in different semesters. Crosslisted with: HIST 411.

**HIST 516. History of Latinos in the United States****3 Credits**

Development of Latino communities since 1500 in what is today the United States. Emphasis on 1846 to present, and on Mexican Americans, Puerto Ricans, and Cuban Americans. Major themes: race, colonialism, immigration, nationalism, class, culture, gender, and politics. Graduate research paper required.

**HIST 517. U.S. Immigration from the Caribbean since 1868****3 Credits**

Examines the history and legacy of the Mongol World Empire founded by Chinggis Khan and his sons, and the dynasties that came to dominate Inner Asia in its wake. Crosslisted with: HIST 417.

**HIST 518. From the Wild West to the Atomic West****3 Credits**

Explores the transformation of the West, with particular attention to the roles of race, class, gender, and culture. Includes extra class meetings to view feature-length films. Graduate research paper required.

**HIST 519. History of Women in the American West****3 Credits**

An introduction into the political, cultural and social history of the Central Asian region from pre-history to the present, including coverage of the empires of the Mongols, Tamerlane and their successors. Crosslisted with: HIST 419.

**HIST 524. Art, Thought and Literature****3 Credits**

Seminar discusses a variety of artistic and literary expressions in their historical contexts and focuses on the ways in which cultural forms both reflect and construct the broader historical trends that surround them.

**HIST 525. History of Magic and Witchcraft in Medieval and Renaissance Europe****3 Credits**

Examines history of popular and scientific beliefs about magic and witchcraft in medieval and early modern Europe. Includes origins of occult Western sciences; Arabic sources of medieval magic; the occult sciences in scholasticism; witchcraft and scholasticism; witchcraft and medieval theology, witch hunts of the 16th and 17th centuries; and the decline of belief in magic and witchcraft. Emphasis on boundaries that defined and separated magic, science, and religion in Western thought from late antiquity through the Scientific Revolution. May be repeated up to 3 credits.

**HIST 527. Labor History****3 Credits**

Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 528. History of Terrorism in Modern Europe and the Middle East****3 Credits**

Advanced analyses of causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas, and Hezbollah in the contemporary Middle East and beyond.

**HIST 535. War and Revolution****3 Credits**

Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

**HIST 536. Nations and Nationalism****3 Credits**

Seminar examines major theories of nationalism from the nineteenth to the twenty-first centuries. Course includes nationalist case studies, from liberal nationalist state-building to ethnic cleansing in the Balkans.

**HIST 538. Special Topics in European History****3 Credits**

Advanced special topics in European history to be announced in the schedule of classes. May be repeated for a maximum of 12 credits.

**HIST 540. Special Topics in Middle Eastern History****3 Credits**

Advanced special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 543. Special Topics in Asian History****3 Credits**

Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 545. Special Topics in United States History****3 Credits**

Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 546. World War I****3 Credits**

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war. Graduate research paper required.

**HIST 548. Nuclear Nation****3 Credits**

Explores post-World War II history and the impact that atomic energy has had on the United States and the world.

**HIST 549. Graduate Readings****1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**HIST 549 L. Splendors of Imperial China****1 Credit**

This course consists of a FLIP trip to China, Fall 2014 which will explore the significant sites of imperial Chinese culture by spending 14 days traveling in China. Consent of instructor required. Crosslisted with: HIST 323 L and ART 511 L.

**HIST 551. Colonial Mexico****3 Credits**

Political, economic, and social development from the Aztecs to 1821. Graduate research paper required.

**HIST 552. Modern Mexico****3 Credits**

From independence to the present, with emphasis on the Revolution. Graduate research paper required.

**HIST 553. Cuba: Colony to Castro****3 Credits**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean, with emphasis on recent events. Graduate research paper required.

**HIST 557. The Mexican Revolution****3 Credits**

Origins, causes, and scope of the Mexican Revolution, including leading personalities, with emphasis on the U.S.-Mexican border. Graduate research paper required.

**HIST 559. Peru: From Incas to Inca Kola****3 Credits**

Crosslisted with: ANTH 559 and GOVT 565

**HIST 560. History of Egypt****3 Credits**

Advanced study of history of Egypt from ancient through modern times. Includes the study of Egypt's interactions with the Middle East and the West, as well as its legacy for both civilizations.

**HIST 561. Islam and the West: Cultural Contacts, Conflicts and Exchanges****3 Credits**

Examines interactions, encounters and cross-fertilization between the Islamic world and the West from the seventh to the twenty-first centuries. Course includes origins of Islam, relationships between Islam, Judaism, and Christianity, and concludes with the post 9/11 present. May be repeated up to 3 credits.

**HIST 566. British Imperialism****3 Credits**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

**HIST 568. Urban History****3 Credits**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

**HIST 570. The Cold War in Latin America****3 Credits**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

**HIST 571. China through the Ming Dynasty****3 Credits**

History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.

**HIST 572. China in the Modern World****3 Credits**

Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required.

**HIST 573. History of Japan****3 Credits**

Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.

**HIST 574. Gender in East Asian History****3 Credits (3+2P)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature (in translation) and cinema used. Same as W S 574.

**HIST 575. History of the Global Political Economy****3 Credits**

Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

**HIST 576. The Holocaust****3 Credits**

Advanced study of the attack on European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession as chancellor in 1933 until the end of the Third Reich in 1945.

**HIST 578. Modern Russia****3 Credits**

Domestic policies and international relations from the mid-nineteenth century to the present with emphasis on the Soviet experience.

**HIST 579. Oral History****3 Credits**

Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.

**HIST 580. Graduate Research Projects****1-6 Credits (1-6)**

Intensive investigation of a selected area of history, including the completion of a research paper or a public history project. Consent of instructor required.

**HIST 581. Time Traveling Through New Mexico's Past****3 Credits**

Instructs historians and educators on how to make history come alive. Semester project includes role playing characters and activities from a past era with local schools and museums.

**HIST 582. History and Memory****3 Credits**

Seminar examines the interplay of memory and history. Explores how various nations and people construct the narratives of their past.

**HIST 583. Advanced Historic Preservation****3 Credits**

Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.

**HIST 585. Public History Internship****3 Credits**

Individual project in an area of public history, including a final written report. Research project required. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**HIST 586. Interpreting Historic Places for the Public****3 Credits**

Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

**HIST 587. United States Labor History to 1877****3 Credits**

Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 588. United States Labor History since 1877****3 Credits**

Seminar discussions explore United States labor and working-class history since 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude and housework. May explore the history of labor organization, working-class culture and leisure activities and responses to labor issues by the state.

**HIST 590. Reading Seminar: Borders, Boundaries and Frontiers****3 Credits**

Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program.

**HIST 591. Reading Seminar: Modernity and its Discontents****3 Credits**

Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.

**HIST 592. Reading Seminar: Nature and Society****3 Credits**

Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.

**HIST 593. Reading Seminar: History, Myth and Memory****3 Credits**

Course analyzes the complex and often contested process of writing national histories, creating national heroes, and forging collective memories. Students assess written texts, memorials, parades and celebrations.

**HIST 594. Public History Seminar****3 Credits**

Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.

**HIST 596. Research Seminar****3 Credits**

Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.

**HIST 597. Public History Article****1-9 Credits (1-9)**

Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.

**HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f)****3 Credits**

Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.

**HIST 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**Name: Mary Holguin, Department Secretary**

**Office Location: Breland Hall Room 237**

**Phone: (575) 646-4601**

**Website: <http://history.nmsu.edu/>**

## History - Bachelor of Arts

The undergraduate history major consists of at least 42 credits in the major field, 24 credits of which must be numbered 300 or above. All courses must be passed with grades of C- or higher, and none may be taken on an S/U basis. Electives must be carefully selected by the student and approved by a Department of History advisor so that the student's program is well tailored to individual goals. All majors must be advised prior to registration.

Among the upper-division courses that majors take, one or more (in addition to HIST 398 Historians and History) must require a research-based paper or papers. In fulfilling their research requirements, majors must write one research-based paper or papers which together total at least 20 pages.

### Departmental Requirements

Select two from the following:	12	
HIST 101G & HIST 102G	Roots of Modern Europe and Modern Europe	
HIST 111G & HIST 112G	Global History to 1500 and Global History Since 1500	
HIST 201G & HIST 202G	Introduction to Early American History and Introduction to Recent American History	
HIST 211G & HIST 212G	East Asia to 1600 and East Asia since 1600	
HIST 221G & HIST 222G	Islamic Civilizations to 1800 and Islamic Civilizations since 1800	
HIST 311V & 311V	Colonial Latin America and Colonial Latin America	
HIST 398	Historians and History <sup>1</sup>	3
Select at least one undergraduate seminar from the following:	3	
HIST 413	Native American History	
HIST 424	History of Art, Thought and Literature	
HIST 431	History of Race and Ethnicity	
HIST 432	United States Labor History to 1877	
HIST 433	United States Labor History Since 1877	
HIST 434	Urban History	
HIST 435	History of War and Revolution	
HIST 436	Nations and Nationalism	
HIST 438	Antiquity and Modernity	
HIST 443	The Cold War in Latin America	
Select six additional 3-credit upper division History courses, at least 1 of which must be a course numbered 400 or above.	18	
<sup>2,3</sup>		
<b>Second Language Requirement:(not required)</b>		
<b>Electives</b>		
Select sufficient electives to bring total credits to 120, including 48 upper-division credits.	81	
Total Credits	117	

<sup>1</sup> Should be taken in junior year after consultation with advisor. Course prerequisite is ENGL 311G Advanced Composition.

<sup>2</sup> No more than nine upper division credits (with exception of HIST 398 Historians and History) may be from any particular field of History. Students may count additional credits in a particular field of History if they pass more than the minimal number of required upper division credits for the degree.

<sup>3</sup> Majors must pass a total of 18 upper division History credits (not including HIST 311V Colonial Latin America, HIST 312V Modern Latin America, and HIST 398 Historians and History) with at least 6 at the 400 level.

## Second Language Requirement

For the Bachelor of Arts in History there is no second language requirement for the degree.

## Secondary Licensure

History majors who are planning on pursuing certification as public school teachers should take the following six courses in preparation. These six courses will complete approximately half of the course work necessary for students to earn teaching licensure in New Mexico. After completing the undergraduate degree in History with a grade point average of 2.5 or above, the student should apply to the Graduate School for admission to the Department of Curriculum and Instruction and the Teacher Education Program in the College of Education to pursue the remaining courses needed to complete secondary licensure.

### Required Courses

EDUC 315	Multicultural Education	3
EDLT 368	Integrating Technology with Teaching	3
SPED 350	Introduction to Special Education in a Diverse Society	3
EDUC 381	Secondary Field Experience	3
EDUC 530	Exploration in Education <sup>1</sup>	3
Total Credits		15

<sup>1</sup> Recommended for senior year or as a graduate student.

## History - Undergraduate Minor

A student may not earn both a bachelor's degree in the Department of History and a minor in History.

### Requirements

Select two from the following:		6
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	
HIST 222G	Islamic Civilizations since 1800	
Select 12 credits in History (at least 9 credits are numbered 300 and above)		12
Total Credits		18

*Note: All courses must be passed with grades of C- or above. No courses may be taken S/U.*

## History - Master of Arts

### Thesis Program

Thirty-six credits (27 of which must be at the 500 level) are required for the thesis program:

Select at least 3 credits from Public History courses above the 500 level	3	
Select four History Graduate Seminars including the following:		
Craft of History seminar	3	
Select two from the following:	6	
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 593	Reading Seminar: History, Myth and Memory	
HIST 596	Research Seminar	3
Select a maximum of 6 credits in related fields outside the Department of History <sup>1</sup>	6	
Select 9 credits at the 500-level or above in the Department of History	9	
HIST 599	Master's Thesis	6
Total Credits	36	

<sup>1</sup> With permission of the graduate advisor, a maximum of 6 credits may be taken in related fields from courses numbered 450 and above outside the Department of History.

A student choosing the thesis program must receive permission for his/her thesis by passing a thesis proposal defense after earning 12 graduate credits in History. The department will provide guidelines for the thesis defense. A student choosing the thesis program must pass a final oral examination over graduate course work and the thesis. All graduate students will be required to present a research paper in a public forum approved by the department's Graduate Director.

### Concentration: Public History

Thirty-six credits (27 of which must be at the 500 level) are required for the Public History concentration:

Select four History Graduate Seminars including the following:	
Public History Seminar	3
Craft of History Seminar	3
Research Seminar	3
Select one from the following:	3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers
HIST 591	Reading Seminar: Modernity and its Discontents
HIST 592	Reading Seminar: Nature and Society

HIST 593	Reading Seminar: History, Myth and Memory	
HIST 585	Public History Internship	3
Select a maximum of 9 credits (450-and above) outside the Department of History <sup>2</sup>		9
Preparation of an article of scholarly quality		3
Select 9 credits from courses numbered 500 and above in the Department of History		9
<b>Total Credits</b>		<b>36</b>

<sup>2</sup> with permission of the Director of the Public History Program

Students in the Public History concentration must collectively pass 18 credits of nonpublic history courses, including the nonpublic history seminars noted above. They must collectively pass 18 credits in public history, which must include the public history seminar, the internship, and the article. The scholarly article is developed through work in the internship and will be of peer reviewed journal quality. The public history credits may include a maximum of 9 graduate level (450 -and-above) credits outside the Department of History with permission of the Director of the Public History Program. A student choosing the Public History concentration must pass an article proposal defense about the proposed scholarly article during the first semester after completion of the internship. The department will provide guidelines for the article defense. A student choosing the Public History specialization must give a public presentation of a portfolio that includes his/her work and the scholarly article, and must pass an oral examination over graduate course work, the internship, and the article. Students who receive a Master's degree in this track will have a specialization in Public History added to their transcripts.

## Dual Track M.A. (Public History AND Thesis)

Students choosing to pursue both the thesis track and Public History concentration must complete the course hours required for the public history concentration, perform an internship, and defend the proposed thesis before undertaking it using guidelines provided by the department, present the public history portfolio at a public presentation, complete the thesis, and defend their course work, thesis and public history portfolio at a final oral examination. In order to satisfactorily complete both programs, such students would complete 39 credits, including three hours of internship credit and six hours of thesis work.

Select four History Graduate Seminars including the following:

Public History Seminar		3
Craft of History Seminar		3
Research Seminar		3
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 593	Reading Seminar: History, Myth and Memory	
HIST 585	Public History Internship	3

Select a maximum of 9 credits (450-and above) outside the Department of History <sup>2</sup>		9
Preparation of an article of scholarly quality		3
Select 3 credits at the 500 level from courses in the Department of History		3
HIST 599	Master's Thesis	6
<b>Total Credits</b>		<b>36</b>

## Public History and Public Administration - Dual M.A. Degree

The Department of History and the Department of Government offer a dual degree in which students who are accepted into both of these programs may simultaneously earn both a Master of Arts in History degree with the Public History specialization, and a Master of Public Administration degree. The dual degree requires 57 total credits, while students who pursued both degrees as separate degrees would need to pass at least 72 credits. Students earning the dual degrees must pass a joint oral examination after passing required courses and completing internship credits in both programs. Students interested in the dual degree program should consult with the Director of the Public History Program and the Director of the Master of Public Administration Program.

## History - Graduate Minor

Students may earn a graduate minor in History by passing the following courses:

Craft of History		3
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 593	Reading Seminar: History, Myth and Memory	
Select two additional 3-credit 500-level and above courses		6
<b>Total Credits</b>		<b>12</b>

Graduate students in History must maintain a 3.0 grade point average in their History courses. A graduate student earning a C or lower grade in one History course will receive a letter of warning. A graduate student earning two or more C or lower grades in History courses or whose History grade point average falls below 3.0 will be removed from the History graduate program. Students must earn at least one B or higher grade in a seminar during their first year in the graduate program, and must take at least one seminar during each year in which they are enrolled in the program. If a graduate student receives one U (Unsatisfactory) grade on his/her thesis or internship, the student will receive a written warning, and if a student received two or more U grades on his/her thesis or internship, the student will be removed from the program.

## Interdisciplinary Studies

The Interdisciplinary Studies Department houses the Bachelor of Applied Studies and Bachelor of Individualized Studies; Gender and Sexuality

Studies Bachelor of Arts degree, Undergraduate Minor, and Graduate Minor; and the International Studies Undergraduate Minor.

## Undergraduate Program Information

### Bachelor of Applied/Individualized Studies

The Interdisciplinary Studies Department extends New Mexico State University's reach beyond traditional academic programs to provide educational opportunities for students to meet their academic, professional, and personal learning goals. The Interdisciplinary Studies Department offers flexible degree programs in the **Bachelor of Applied Studies (BAS)** and the **Bachelor of Individualized Studies (BIS)**, giving students the opportunity to work with an advisor to develop their own interdisciplinary program, appropriate to their unique educational and career goals.

The Bachelor of Applied Studies is a program designed for those students who have procured an Associates of Applied Studies (AAS) at a community or two-year college. This major allows students to transfer credits and build from their Associates degree toward a university-level degree. The aim is to equip students to effectively build from their applied backgrounds and knowledge to shift careers or to advance in their chosen career.

The Bachelor of Individualized Studies is a flexible degree program serving multiple needs. It can be designed to serve students desiring an academic degree not offered at NMSU, particularly students with broad or diverse academic and career interests. It can also allow students to complete a college degree when an initial major does not fit as well as planned. Its flexibility in accepting course credits also serves as a completion program for students who left college and now want to return to earn a Bachelor degree. A well-designed interdisciplinary curriculum emphasizes the value of approaching complex issues from multiple perspectives, equipping students with the requisite critical and analytical skills to become effective problem solvers in a chosen career.

### Minors Recommended for BAS & BIS Majors

Students seeking a **Bachelor of Applied Studies** or the **Bachelor of Individualized Studies** degree are encouraged to complete one or more minors offered through various NMSU colleges. A minor is designated on a transcript and consists of a minimum of 18 credits, nine of which must be upper-division. Courses required to complete a minor may be in a single department or interdepartmental, are offered through various NMSU colleges, and are subject to availability. Students seeking to complete a minor must have the minor verified, prior to graduation, by the college academic department administering the minor. Specific requirements for minors may be obtained from the academic department administering a specific minor, the academic department's college dean's office, and in the college departmental listings of this catalog. *Note:* The College of Business allows *only* the Business Administration minor for BAS and BIS majors and no more than a total of 30 credits in the College of Business.

### Gender and Sexuality Studies

The Interdisciplinary Studies Department offers a **Bachelor of Arts in Gender & Sexuality Studies**, an **Undergraduate Minor in Gender & Sexuality Studies**, and a **Graduate Minor in Gender and Sexuality Studies**. Gender and Sexuality Studies specializes in the examination of gender; gender identity; queer and transgender studies; feminisms; and social justice from interdisciplinary perspectives. This field of study equips students with analytical skills and knowledge to engage power structures critically and to transform lives and communities. Courses are offered

both online and on campus, and this degree is one of a few at NMSU in which all major and minor requirements can be taken online.

## International Studies

The Interdisciplinary Studies Department offers an **Undergraduate Minor in International Studies**, an interdisciplinary program enabling students, regardless of their major area of study, to develop a broad understanding of the rapidly changing global environment by proving a curriculum that encompasses the social, political, cultural and economic forces at work in an increasingly interdependent world.

Though not a requirement, students working toward the **Undergraduate Minor in International Studies** can also take part in the **Peace Corps Prep Program** at NMSU, a program that fits well with aims of the minor. This program is designed to be a component of an undergraduate curriculum that includes experiential-based community service and selected courses to help prepare students for volunteer service in international development.

## Degrees for the Department

Applied Studies - Bachelor of Applied Studies (p. 341)

Gender & Sexuality Studies - Bachelor of Arts (p. 342)

Individualized Studies - Bachelor of Individualized Studies (p. 343)

## Minor for the Department

Gender & Sexuality Studies - Undergraduate Minor (p. 343)

Gender & Sexuality Studies - Graduate Minor (p. 345)

International Studies - Undergraduate Minor (p. 344)

**Professor, Patti Wojahn, Department Head**

**Professor, Laura A. Williams, Gender & Sexuality Studies Program Director**

**Professors** C. Bejarano, J. Maupin, P. Wojahn; **Associate Professors** M. Hamzeh, M.C. Jonet; **Assistant Professor** L. Williams

## Applied and Individualized Studies Courses

### INTR 300. Foundations of Interdisciplinary Studies 3 Credits

Introduction to Bachelor of Individualized Studies (BIS) and Bachelor of Applied Studies (BAS) degree programs. Explores roles of interdisciplinary studies in contemporary world and how emerging and perennial problems and issues can be comprehended utilizing multiple theoretical and analytic methods. Students design or update their course of study for earning the BIS or BAS degree. Consent of Instructor required. Restricted to Las Cruces campus only.

### INTR 301. Interdisciplinary Research: Theory & Practice 3 Credits

Focuses on knowledge gained through interdisciplinary research. Students develop comprehensive understanding of steps of systematic inquiry into interdisciplinary research questions. Includes active learning through design and implementation of an interdisciplinary research project. For BIS and BAS majors only. Consent of Instructor required.

## Women's Studies Courses

### W S 201G. Introduction to Women's Studies 3 Credits

Analysis of the status of women in society today and history and consequences of gender stratification and inequality from the perspectives of sociology, anthropology, psychology, political science, and other sciences.

### W S 202G. Representing Women Across Cultures 3 Credits

Historical and critical examination of women's contributions to the humanities, with emphasis on the issues of representation that have contributed to exclusion and marginalization of women and their achievements. Crosslisted with: HON 218

### W S 316. History of Women in the American West 3 Credits

Experiences and interactions among Native American, Spanish/Mexican, immigrant, and Anglo-American women in the American West from 1500 to the present. Same as HIST 316.

### W S 345. Victimology 3 Credits

Same as C J 345.

### W S 350. Special Topics 3 Credits

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 300-level from any specific department. May be repeated under different subtitle(s).

### W S 359. Psychology of Gender 3 Credits

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: PSY 359.

**Prerequisite(s):** PSY 201G.

### W S 360. Masculinities Studies 3 Credits

Explores how contemporary American culture constructs manhood and masculinity. Interrogates ideas and enactments of masculinity, especially as they intersect with race/ethnicity, class, and sexuality. The class asks how sexuality, gender construction, and sex roles inform our understanding of masculinity, as well as how masculinity relates to social power.

### W S 380V. Women Writers 3 Credits

Same as ENGL 380V.

### W S 381V. Women's Health Issues 3 Credits

Same as HL S 380V.

### W S 382. Women in Mass Media 3 Credits

Same as JOUR 380.

### W S 401. Women & Immigration 3 Credits (3)

Explores historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

### W S 402. Transnational Feminisms 3 Credits (3)

Explores dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

### W S 403. Gender & Horror 3 Credits (3)

Explores cultural anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

### W S 404. Arab-Muslim Feminisms 3 Credits

Develops a historical understanding of arab-muslim feminisms and homosexuality in Islam. Explores and uses critical feminist theories, language, and methods to counter interlocking discourses of Islamophobia, gendering, and homophobia affecting arab-muslim women.

### W S 405. Alternative Genders and Sexualities 3 Credits

Introduces students to cultural study in the academic fields of Gay, Lesbian, Bisexual, Transgender (GLBT) and Queer Studies. Examines academic texts as well as literature and film from different historical moments and social/ global sites.

### W S 406. Women and Human Rights 3 Credits

Analysis of human rights violations and injustices as they relate to the lives of girls and women. Examines international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, discusses social, political, economic, and human rights.

### W S 407. Gender and Graphic Narrative 3 Credits

Examines graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

### W S 408. Food and Representation 3 Credits

Examines contemporary food writing as a way to study identity, social structures, and notions of acceptability. Explores how constructions of food shape bodies, desires, and notions of belonging.

### W S 411. Gender and Migration 3 Credits

Explores multiple experiences of forced migration and displacement. Examines violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

**W S 412. Gender and Film Studies****3 Credits**

Examines the shifting cultural and theoretical meanings of gender and sexuality across a variety of film genres while also analyzing the role of formal film elements in shaping representation and reception.

**W S 420. Girls, Women and Crime****3 Credits (3)**

Critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, W S majors. Crosslisted with: C J 420

**W S 433. Women, Gender, and Culture****3 Credits**

Same as ANTH 433.

**W S 450. Special Topics****3 Credits**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 400-level from any specific department. May be repeated under different subtitle(s).

**W S 451. Women's Studies Practicum****3 Credits**

Supervised field work in community setting relating to women. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**W S 453. Women and Politics****3 Credits**

Crosslisted with: GOVT 353

**W S 454. Women Crossing Borders****3 Credits**

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's Interactions across borders. Emphasis will vary with professor and discipline.

**W S 455. Feminist Research Methodologies****3 Credits**

Study of feminist methodologies, covering transnational decolonizing Indigenous, Chicana feminist approaches to research, such as storytelling, narrative, testimonio, platica, research-based art, performed ethnography and participatory action research. May be repeated up to 3 credits.

**W S 461. Women s Studies: Independent Study****3 Credits**

Individual study of selected topic and writing of research paper. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**W S 465. Sex, Gender and the Body****3 Credits**

Examines forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

**Prerequisite(s):** None.

**W S 468. Global Sexualities****3 Credits**

Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with W S 568. Crosslisted with: SOC 468

**W S 471. Seminar in Feminist Theory****3 Credits**

Current feminist theory. Topic changes by semester. Course subtitled in the Schedule of Classes. Prerequisite: None

**W S 474. Gender in East Asian History****3 Credits**

Same as HIST 474.

**W S 482. Gender and Popular Culture****3 Credits**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 99 credits.

**W S 484. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: ENGL 481

**W S 501. Advanced Women & Immigration****3 Credits (3)**

Advanced exploration of historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

**W S 502. Advanced Transnational Feminisms****3 Credits (3)**

Advanced analysis of dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

**W S 503. Advanced Gender & Horror****3 Credits (3)**

Advanced analysis of anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

**W S 504. Advanced Arab-Muslim Feminisms****3 Credits**

Advanced study of historical and contemporary arab-muslim feminisms and homosexuality in Islam. Explores and uses critical feminist theories, language, and methods to counter interlocking discourses of Islamophobia, gendering, and homophobia affecting arab-muslim women.

**W S 505. Advanced Alternative Genders and Sexualities****3 Credits**

Advanced study of the academic fields of Gay, Lesbian, Bisexual, Transgender (GLBT) and Queer Studies. Examines academic texts as well as literature and film from different historical moments and social/ global sites.

**W S 506. Advanced Women and Human Rights****3 Credits**

Advanced analysis of human rights violations and injustices as they relate to the lives of girls and women. Intensive examination of international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, explores social, political, economic, and human rights.

**W S 507. Advanced Gender and Graphic Narrative****3 Credits**

Advanced examination of graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

**W S 508. Advanced Food Presentation****3 Credits**

Advanced examination of contemporary food writing as a way to study identity, social structures, and notions of acceptability. Intensive exploration of how constructions of food shape bodies, desires, and notions of belonging.

**W S 511. Advanced Gender and Migration****3 Credits**

Advanced exploration of multiple experiences of forced migration and displacement. Intensive examination of violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

**W S 512. Advanced Gender and Film Studies****3 Credits**

Advanced study of the shifting cultural and theoretical meanings of gender and sexuality across a variety of film genres while also analyzing the role of formal film elements in shaping representation and reception.

**W S 520. Advanced Girls, Women & Crime****3 Credits (3)**

Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Crosslisted with: C J 520

**W S 533. Advanced Issues in Women, Gender, and Culture****3 Credits**

Same as ANTH 533.

**W S 550. Special Topics****3 Credits**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 500-level from any specific department. May be repeated under different subtitle(s).

**W S 554. Advanced Issues in Women Crossing Borders****3 Credits**

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's interactions across borders.

**W S 555. Advanced Feminist Research Methodologies****3 Credits**

Advanced study of feminist methodologies, covering transnational decolonizing Indigenous, Chicana feminist approaches to research, such as storytelling, narrative, testimonio, plática, research-based art, performed ethnography and participatory action research. May be repeated up to 3 credits.

**W S 561. Independent Graduate Research in Women's Studies****3 Credits**

Individual study of selected topics and writing of a research paper. May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**W S 565. Advanced Sex, Gender & the Body****3 Credits (3)**

Advanced examination of forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

**W S 567. Global Sexualities****3 Credits**

Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with W S 468. Crosslisted with: SOC 568

**W S 571. Advanced Seminar in Feminist Theory****3 Credits**

Current feminist theory. Topic changes by semester. Course subtitled in the Schedule of Classes.

**W S 574. Gender in East Asian History****3 Credits**

Same as HIST 474 with differentiated assignments for graduate students. Required for graduate credit.

**W S 582. Gender and Popular Culture****3 Credits**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: ENGL 582

**W S 584. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: ENGL 581

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**Gender & Sexuality Studies Website:** <http://genders.nmsu.edu/>

## Applied Studies - Bachelor of Applied Studies

The Bachelor of Applied Studies (BAS) degree promotes the mission and purpose of NMSU by making available flexible degree options and by providing a pathway of study for community college graduates with technical and applied degrees from an accredited institution. The BAS degree helps minimize credit loss for associate degree graduates when pursuing a baccalaureate degree at NMSU. The student population targeted for this program differs significantly from traditional degree programs at NMSU. The BAS offers opportunity for current and prospective students and welcomes those employed full-time, veterans,

active duty military personnel or active duty family members, transfers from other institutions, those returning to college after time away, and students wishing to complete their upper-division coursework at a distance.

## To Declare a BAS

Students entering the BAS program are required to:

- Have an Associate of Applied Science or a similar degree from a regionally accredited institution
- Have completed the English and Mathematics Basic Skills Requirements of NMSU (see Regulations - Basic Academic Skills) (p. 53)
- Declare the BAS degree by the last date to drop with a "W" in a student's final semester of study (see the NMSU Academic Calendar for date)

## Degree Requirements

To graduate with the Bachelor of Applied Studies degree, you must complete at minimum 120 credit hours (or more, depending on the number and type of credits acquired in your Associate degree and as determined by your academic advisor). (*Note: The NMSU College of Business allows a maximum of 30 business credit hours to count towards the BAS degree. Also, the only College of Business minor allowed is the Business Administration Minor.*)

Within the total credit hours, you must

- Complete the university's general education core requirements (at least 35 credit hours of approved New Mexico Common Core courses)
- Complete a minimum of 48 credit hours of upper-division courses (300-499 level), including six credits of Viewing a Wider World (VWW) from courses in two separate colleges at NMSU. You may substitute three credits of VWW with credits taken in study abroad. A minimum of 36 of the 48 required upper-division credits must have a grade of C- or better.
- Not have completed the requirements, or be a candidate, for another baccalaureate degree

In addition, it is strongly recommended that students take one or more of the Interdisciplinary Studies courses designed specifically for the Bachelor of Applied Studies and the Bachelor of Individualized Studies degrees: INTR 300 Foundations of Interdisciplinary Studies and/or INTR 301 Interdisciplinary Research: Theory & Practice. These courses prepare BAS and BIS students to better plan and conceptualize their degree as they prepare to move into their professional careers or graduate school.

## Second Language Requirement

For the Bachelor of Applied Studies there is no second language requirement for the degree.

# Gender and Sexuality Studies - Bachelor of Arts

*Note: Women's Studies has changed its name to Gender & Sexuality Studies. Its course prefix (W S) remains the same but will soon change to the prefix GNDR. Many course titles will be changing as well to reflect the broader focus on genders and sexualities.*

The undergraduate major in Gender and Sexuality Studies specializes in the examination of gender; gender identity; queer and transgender studies; feminisms; and social justice from interdisciplinary perspectives. Students develop a strong understanding of how interconnected social formations such as race, class, age, nation, citizenship, ability, and other categories of difference are constructed and intersect with gender and sexuality. Our courses equip students with analytical skills and knowledge to engage power structures critically and transform lives and communities.

Gender and Sexuality Studies readies students for further study in the field at the graduate level as well as advanced study in a variety of disciplines. We offer a plan of study that integrates humanities and social sciences methods and objects of study, including areas of concentration such as human rights and transnational migration; socially engaged literature, film, and other creative media; and transnational and anti-colonial methodologies.

Gender and Sexuality Studies students prepare for careers in such fields as advocacy and social organizing, community development, creative writing, criminal justice, education, filmmaking and video production, health care, human resources, journalism, law, music production, social services, and visual arts. Many students declare a double major in Gender and Sexuality Studies with another discipline to enhance career opportunities and learning.

Courses are offered both online and on campus. In addition to the B.A., Gender and Sexuality Studies offers an undergraduate minor and graduate minor.

Degree requirements for the major include

- 9 credit hours of required Gender & Sexuality Studies courses;
- 18 credit hours of Gender & Sexuality Studies electives; and
- 9 credit hours from a number of cross-listed courses offered both by Gender & Sexuality Studies and by other programs/departments.
- The total credit hour requirement for the major is 36 credit hours with 21 hours at the upper division level. All requirements must be completed with a grade of C- or higher.

## Required Core Courses

W S 201G	Introduction to Women's Studies	3
or W S 202G	Representing Women Across Cultures	
W S 455	Feminist Research Methodologies	3
or W S 465	Sex, Gender and the Body	
W S 471	Seminar in Feminist Theory	3

## Electives

Select six from the following:		18
W S 360	Masculinities Studies	
W S 401	Women & Immigration	
W S 402	Transnational Feminisms	
W S 403	Gender & Horror	
W S 404	Arab-Muslim Feminisms	
W S 405	Alternative Genders and Sexualities	
W S 406	Women and Human Rights	
W S 407	Gender and Graphic Narrative	
W S 408	Food and Representation	
W S 411	Gender and Migration	
W S 412	Gender and Film Studies	

W S 450	Special Topics	
W S 451	Women's Studies Practicum	
W S 454	Women Crossing Borders	
W S 482	Gender and Popular Culture	
Electives from upper division W S and cross-listed courses		9
<b>Second Language Requirement: (not required)</b>		
Total Credits		36

## Second Language Requirement

For the Bachelor of Arts with a major in Gender & Sexuality Studies, there is no second language requirement for the degree.

## Individualized Studies - Bachelor of Individualized Studies

The Bachelor of Individualized Studies (BIS) prepares students for 21<sup>st</sup> century challenges. This degree serves students desiring an academic degree not already offered at NMSU. Students served by the BIS are those with extensive, comprehensive or eclectic academic and career interests. Self-motivated and self-directed students work closely with an advisor to select classes each semester with the intent of graduating in a timely manner, ideally with at least one minor. Recommended and chosen courses should be organized to meet the unique educational needs of the student, be it professional advancement within an existing career, academic preparation for graduate or professional programs, a strategy for career change, or a plan for efficiently utilizing prior university credits to complete a Bachelor Degree.

A well-designed individualized curriculum emphasizes the value of approaching complex issues from multiple perspectives, equipping students with the requisite critical and analytical skills to become effective problem solvers in their chosen fields of study or career. Each student should select courses designed to integrate academic and career goals into a cohesive degree program.

Extensive flexibility in program design implies increased individual responsibility for the BIS student. BIS students must be active participants in their academic experience, simultaneously pursuing a skill-set demonstrating:

- Coherent expression of ideas in writing;
- Capacity to conduct systematic and objective inquiry within their program of study;
- Ability to tolerate ambiguity within the design and implementation of a program of study;
- Proactive communication with the academic advisor;
- Commitment to effective follow-through on tasks related to program of study design and implementation.

## To Declare a BIS

Students entering the BIS degree program work in consultation with a BIS advisor and complete a series of courses building on the applicant's existing coursework and complementing the applicant's education or career goals.

**Deadline for Declaring BIS Major:** Students must declare the BIS degree by the last date to drop with a "W" in a student's final semester of study (see *NMSU Academic Calendar* for date).

## Degree Requirements

To graduate with the Bachelor of Individualized Studies degree, you must complete a minimum 120 credit hours (or more, as determined in consultation with your academic advisor). (*Note: The NMSU College of Business allows a maximum of 30 business credit hours (excluding A ST 251G) to count towards the BAS degree. Also, the only College of Business minor allowed is the Business Administration Minor.*)

BIS students must also

- Complete a minimum of 48 credit hours of upper-division courses (300-499 level), including six credits of Viewing a Wider World (VWW) from courses in two separate colleges at NMSU. You may substitute three credits of VWW with credits taken in study abroad. A minimum of 36 of the 48 required upper-division credits must have a grade of C- or better.
- Complete the University's General Education Core Requirements (*minimum of 35 credit hours of approved New Mexico Common Core courses*).
- Not have completed the requirements, or be a candidate, for another baccalaureate degree.

In addition, it is strongly recommended that students take one or more of the Interdisciplinary Studies courses designed specifically for the Bachelor of Applied Studies and the Bachelor of Individualized Studies degrees: INTR 300 Foundations of Interdisciplinary Studies and/or INTR 301 Interdisciplinary Research: Theory & Practice. These courses prepare BAS and BIS students to better plan and conceptualize their degree as they prepare to move into their professional careers or graduate school.

## Second Language Requirement

For the Bachelor of Individualized Studies there is no second language requirement for the degree.

## Gender and Sexuality Studies - Undergraduate Minor

A minor in Gender & Sexuality Studies consists of 18 credit hours of approved course work in Gender & Sexuality Studies of which at least 12 are upper division (300 level or above).

### Required Core Courses

W S 201G	Introduction to Women s Studies	3
or W S 202G	Representing Women Across Cultures	
Select one from the following:		3
W S 471	Seminar in Feminist Theory	
W S 402	Transnational Feminisms	
W S 455	Feminist Research Methodologies	
W S 465	Sex, Gender and the Body	
Select 12 credits from the following:		12
W S 360	Masculinities Studies	
W S 401	Women & Immigration	
W S 403	Gender & Horror	
W S 404	Arab-Muslim Feminisms	
W S 405	Alternative Genders and Sexualities	
W S 406	Women and Human Rights	
W S 407	Gender and Graphic Narrative	

W S 408	Food and Representation	
W S 411	Gender and Migration	
W S 412	Gender and Film Studies	
W S 450	Special Topics	
W S 451	Women's Studies Practicum	
W S 454	Women Crossing Borders	
W S 482	Gender and Popular Culture	
Total Credits		18

Note: A student may not earn a bachelor's degree in Gender & Sexuality Studies and also earn a minor in Gender & Sexuality Studies.

## International Studies - Undergraduate Minor

A minor in International Studies consists of 18 credit hours of approved interdisciplinary course work of which at least 12 are upper division (300 level or above). No more than 3 credits of Independent Study may be applied to the minor and only 2 courses (6 credits) may be double counted with the course of the student's major(s). Students must maintain a minimum 2.5 GPA.

### Required Coursework

#### Introductory Course:

ANTH 125G	Introduction to World Cultures	3
or AXED 480	International Agricultural Development	

#### International Experience:

A S 350	Faculty Led International Travel	3
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#### Culture/Arts/Humanities:<sup>1</sup>

ANTH 330V	Magic, Witchcraft and Religion	
ANTH 360V	Food and Culture Around the World	
COMM 376	Communication and Culture	
COMM 475	International Communication	
ENGL 244G	Literature and Culture	
HON 218	Women Across Cultures	
PHIL 332	Ethics and Global Poverty	
SOC 458V	Comparative Global Family Systems	
SOC 489	Globalization	
W S 202G	Representing Women Across Cultures	
W S 401	Women & Immigration	
W S 402	Transnational Feminisms	
W S 433	Women, Gender, and Culture	
W S 454	Women Crossing Borders	

#### History/Geography:<sup>1</sup>

GEOG 112G	World Regional Geography	3
GEOG 120G	Culture and Environment	
GEOG 363V	Cultural Geography	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 211G	East Asia to 1600	
or HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	
or HIST 222G	Islamic Civilizations since 1800	
HIST 312V	Modern Latin America	

HIST 474	Gender in East Asian History	
Government/Politics/Economics: <sup>1</sup>		3
COMM 458	Intercultural Communication and National Security	
ECON 324V	Developing Nations	
I B 317	International Marketing	
I B 398	International Business and Economic Environments	
I B 450	International Economics	
I B 458	Comparative International Management	
I B 475	International Finance	
MGT 458	Comparative International Management	
MKTG 317	International Marketing	
GOVT 160G	International Political Issues	
GOVT 313	Model United Nations	
GOVT 335	Management of Nonprofit Organizations	
GOVT 360	International Relations	
GOVT 361	Special Topics in International Relations	
GOVT 362	International Political Economy	
GOVT 366	American Foreign Policy	
GOVT 396	International Law	
GOVT 469	Globalization	
HON 340V	Indian Law and Policy	
Health/Education/Environment: <sup>1</sup>		3
AG E 315V	World Agriculture and Food Problems	
ANSC 351V	Agricultural Animals of the World	
ANTH 360V	Food and Culture Around the World	
AXED 400	The Diffusion and Adoption of Agricultural Innovations	
AXED 430	Teaching Adults in Nonformal Settings	
AXED 436	Keys for Agricultural and Rural Development	
ECON 337V	Natural Resource Economics	
EDUC 315	Multicultural Education	
FWCE 110G	Introduction to Natural Resources Management	
GOVT 335	Management of Nonprofit Organizations	
MGT 375V	Global Environmental Assessment and Management	
HON 305V	Global Environment	
PHLS 305V	Global Environmental Health Issues	
PHLS 375	Foundations of Community Health Education	
PHLS 465	International Health Problems	
SOC 458V	Comparative Global Family Systems	
Total Credits		18

<sup>1</sup> Other courses may be substituted if approved by advisor and Dept of IDS

## Gender and Sexuality Studies - Graduate Minor

The graduate minor in Gender and Sexuality Studies specializes in the examination of gender; gender identity; queer and transgender studies; feminisms; and social justice from interdisciplinary perspectives. Students develop a strong understanding of how interconnected social formations such as race, class, age, nation, citizenship, ability, and other categories of difference are constructed and intersect with gender and sexuality. The graduate minor in Gender and Sexuality Studies offers students a documented emphasis in their academic training in the field of Gender and Sexuality Studies. The graduate minor allows students to acquire specialized knowledge through the interdisciplinary curriculum offered by Gender and Sexuality Studies and to integrate theoretical perspectives and methodologies from Gender and Sexuality Studies into diverse academic fields. Our courses equip students with analytical skills and knowledge to engage power structures critically and transform lives and communities.

We offer a plan of study that integrates humanities and social sciences methods and objects of study, including areas of concentration such as human rights and transnational migration; socially engaged literature, film, and other creative media; and transnational and anti-colonial methodologies. The graduate minor in Gender and Sexuality Studies complements many advanced degree programs at NMSU including Anthropology, Art, Biology, Business Administration, Chemistry, Clinical and Mental Health Counseling, Communication Studies, Creative Writing, Criminal Justice, Curriculum and Instruction, Economics, Education, English, Government, History, Psychology, Public Health Sciences, Social Work, Sociology, Spanish, and others.

Gender and Sexuality Studies students prepare for careers in such fields as advocacy and social organizing, community development, creative writing, criminal justice, education, filmmaking and video production, health care, human resources, journalism, law, music production, social services, and visual arts. Many students declare a graduate minor in Gender and Sexuality Studies to enhance career opportunities and learning.

Courses are offered both online and on campus. In addition to the graduate minor, Gender and Sexuality Studies offers a B.A. and undergraduate minor.

### Master's and Doctoral minor candidates:

Required Core Course

W S 571	Advanced Seminar in Feminist Theory	3
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### For a Master's Degree minor candidate:

6 additional credit hours from upper level Gender & Sexuality Studies courses or courses cross-listed with Women's Studies and other departments/programs are required. (9 credit hours total)

### For a Doctoral Degree minor candidate:

9 additional credit hours from upper level Gender & Sexuality Studies courses or courses cross-listed with Women's Studies and other departments/programs are required. (12 credit hours total)

## Journalism and Media Studies Undergraduate Program Information

Studies in Journalism and Media Studies prepare students for careers in mass media, including news/editorial (print and online), broadcasting, advertising, public relations and photojournalism. Students study these disciplines and learn the trends and changes in the industry, such as how they converge on the internet. The curriculum emphasizes the skills of gathering, evaluating, writing and disseminating information and related skills. Students also are instructed in the theory, law, history and professional guidelines of mass media.

### Degrees for the Department

Journalism and Media Studies - Bachelor of Arts (p. 347)

### Minors for the Department

Journalism and Media Studies - Undergraduate Minor (p. 349)

#### Professor, Chung, Department Head

**Associate Professors** Berman, Lamonica, Mellen (<http://web.nmsu.edu/~rpmellen>); **Assistant Professor** Cardenas, Phillips; **College Assistant Professor** Miller, Perez; **Professor Emeritus** McCleneghan, Thayer  
**Instructors** Faivre, B. Page, Porter, Tallman; **News22 Director** Miller; **Spanish News22 Director** Perez

### Journalism and Media Studies Courses

#### JOUR 102. Grammar for Journalists

##### 2 Credits

Instruction of basic grammar, spelling and punctuation. Required for all journalism students with an ACT English score below 25, SAT Verbal below 570, or students who have not taken ACT/SAT tests. Restricted to Las Cruces campus only.

#### JOUR 105G. Media and Society

##### 3 Credits

Functions and organization of the mass media system in the United States; power of the mass media to affect knowledge, opinions, and social values; and the impact of new technologies.

#### JOUR 110. Introduction to Media Writing

##### 3 Credits (2+2P)

Preparation of copy for broadcasting, print, advertising, and public relations. Introduction to Web applications. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 102 or ACT score of 25 and above or SAT score of 570 and above.

#### JOUR 201. Introduction to Multimedia

##### 3 Credits

Provide students with the basic skills to produce multimedia packages using text, photos, audio and video, as well as social media for professional purposes. Intensive hands-on class using editing software such as Adobe Premiere, Adobe Audition and Photoshop. May be repeated up to 3 credits.

**JOUR 210. Newswriting & Reporting****3 Credits (2+2P)**

Intensive laboratory practice in writing and field reporting news for print and Internet. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** JOUR 102 or ACT score of 25 and above or SAT score of 570 and above and JOUR 110.

**JOUR 300. Introduction to Advertising****3 Credits**

Role of IMC (integrated marketing communications) in marketing of goods, services, and organizations. Creative process, strategic planning media, message design, consumer behavior, and social issues of IMC.

**JOUR 302. Video Production****3 Credits**

Classroom instruction on basic studio and single camera video productions, with focus on practical aspects of news production. Lab experience in camera basics, studio functions and digital video editing. Includes practical experience through crew assignments on the live student-produced newscast, News22, which airs on KRWG-TV, a PBS affiliate station. May be repeated up to 3 credits.

**JOUR 306. Feature Writing****3 Credits**

The preparation of feature stories for newspapers and magazines. How to develop a variety of stories, research topics, interview sources, polish writing and market work. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits.

**Prerequisite(s):** JOUR 210 or consent of instructor.

**JOUR 310. News Reporting & Publishing****3 Credits**

Field reporting and news writing for print and Web applications. Instruction in community coverage, reporter responsibility, ethics and news values. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 210.

**JOUR 312. Advertising/Copywriting****3 Credits**

Creative process, strategic thinking, and principles of advertising in execution of copy, storyboards, and layouts for clients.

**Prerequisite(s):** JOUR 110 or consent.

**JOUR 314. Broadcast Reporting****3 Credits**

Writing, editing, producing, announcing and reporting of TV and radio news. May be repeated up to 3 credits.

**Corequisite(s):** JOUR 210.

**JOUR 315. News 22****1-3 Credits (1-3)**

Write, report, produce, anchor, shoot and edit video for live student television newscast airing on KRWG, public television for Southern New Mexico sports, weather, and news.

**Prerequisite(s):** JOUR 314 or JOUR 330 or instructor consent.

**JOUR 317. News Editing****3 Credits**

Extensive, directed practice in various aspects of computer editing for printed publication. Headline writing, copy editing, design, and layout.

**Prerequisite(s):** JOUR 210.

**JOUR 319. Intro Photography****3 Credits**

Introduction to photography emphasizing composition, basic camera technique, language of photography and storytelling. Photojournalism emphasis. Basic camera and processing techniques and skills. May be repeated up to 3 credits.

**JOUR 320. Photojournalism****3 Credits**

Communication photography for magazine, news, advertising/public relations and other communication needs. Digital Photography, lighting techniques, photo-editing software, and web site skills. Students provide camera and flash. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 319 or Consent of instructor.

**JOUR 321. Media Graphic Design****3 Credits**

Concepts and design skills useful for all aspects of journalism - print media and newsletters, basics of Photoshop and introduction to Web design. May be repeated up to 3 credits.

**JOUR 330. TV News Shooting & Editing****3 Credits (2+4P)**

Overview of technical and aesthetic skills and journalism basics needed for shooting and editing on-location news productions. Single camera videography and nonlinear/digital editing. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 302 or permission of instructor.

**JOUR 350. Media History****3 Credits**

Historical overview of mass media with emphasis on roots of journalism, technological developments, and American role in international media. May be repeated up to 3 credits.

**JOUR 374. Introduction to Public Relations****3 Credits**

Introduction to public relations as a communication process that builds relationships between organizations and their publics. Explores basic techniques, strategies, and tactics used in businesses, nonprofits, and in government.

**Prerequisite(s):** JOUR 110.

**JOUR 377V. Mass Media Ethics****3 Credits**

Philosophical and moral examination of problems relating to mass media. Use of case study method to analyze media situations; development of framework for media professionalism.

**JOUR 380. Women and the Media****3 Credits**

Portrayal and participation of women in mass media from colonial to contemporary times. Same as W S 450. May be repeated up to 3 credits.

**JOUR 399. New Mexico Law****3 Credits**

Same as C J 399, GOVT 399, HIST 399, and SOC 399.

**JOUR 407. Media Internship****1-3 Credits (1-3)**

Paid supervised work with a mass communications organization. Students who take JOUR 407 may not take JOUR 408. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: Journalism majors.

**Prerequisite(s):** Consent of internship coordinator.

**JOUR 408. Media Practicum****1-3 Credits**

Advanced supervised work with a media organization. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of internship coordinator.

**JOUR 412. Documentary Photojournalism****3 Credits**

Production of documentary photography for web, print, books and exhibition emphasizing storytelling techniques. Multimedia and Web site techniques. Field Trips to produce material for the Small Village New Mexico project (SVNM). Produce Term projectbook. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 319.

**JOUR 414. RTV Scriptwriting/Performance****3 Credits**

Writing and delivery of news scripts for radio and television. Focus on anchoring announcing, voice technique and performance.

**Prerequisite(s):** JOUR 314 or consent of instructor.

**JOUR 425. Media Planning and Buying****3 Credits**

Covers the principles of media planning for an IMC campaign and procedures for purchasing ad time or space.

**Prerequisite(s):** JOUR 300 or consent of instructor.

**JOUR 427. Multimedia Publishing****3 Credits**

Writing-based course stresses the online telling of a story in many ways: text, photography, slide shows, audio and video news gathering, editing and posting.

**Prerequisite(s):** JOUR 201.

**JOUR 460. Public Relations Promotion in Sports****3 Credits**

Examination of sports as a business and how public relations promotion is executed in professional sports franchises.

**JOUR 476. Public Relations Campaigns****3 Credits**

Utilizing the principles and techniques of public relations to research and develop a comprehensive plan for a long-term national, regional, or local campaign. May be repeated up to 3 credits. Restricted to: Restricted to Journalism majors.

**Prerequisite(s):** JOUR 210, JOUR 374.

**JOUR 484. Public Opinion****3 Credits**

Seminar on forces which help form public opinion; individual projects in attitude measurement; measuring effectiveness of mass communication.

**JOUR 489. Media Research****3 Credits**

Examination of the role of empirical research in solving mass communication problems. Survey techniques, field studies, content analysis, data analysis. May be repeated up to 3 credits.

**JOUR 490. Advertising Campaigns****3 Credits**

Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local IMC (Integrated Marketing Communications) campaign. Consent of instructor required.

**Prerequisite(s):** JOUR 300 and 312 or consent of instructor.

**JOUR 493. Media Law****3 Credits**

Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, GOVT 493. May be repeated up to 3 credits.

**JOUR 494. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes.

**JOUR 495. Mass Communication Theory****3 Credits**

Theoretical approaches to mass communications. Examination of media effects, audiences, media socialization.

**JOUR 499. Independent Study in Media****1-3 Credits**

Individual study directed by consenting instructor with prior approval of department head. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** 2.5 GPA and consent of instructor.

**Office Location:** Milton Hall Room 186

**Phone:** (575) 646-1034

**Website:** <http://journalism.nmsu.edu/>

## Journalism and Media Studies - Bachelor of Arts

Students are required to complete

- 15 hours of core courses, or 17 hours of core courses if they do not meet the required English ACT or SAT scores (see below),
- then complete a minimum 24 hours of courses in the department, bringing the allowable minimum of 39 hours (41 hours to those who don't meet the required English scores).

Students must complete at least 72 hours of courses outside the department.

**Core Requirements (Required of Majors)**

JOUR 102	Grammar for Journalists <sup>1</sup>	2
JOUR 105G	Media and Society	3
JOUR 110	Introduction to Media Writing	3
JOUR 201	Introduction to Multimedia	3
JOUR 210	Newsriting & Reporting	3
JOUR 493	Media Law	3

**Advanced Requirements <sup>2</sup>***Introductory Professional Courses <sup>3</sup>*

Select at least 3 credits from the following: <sup>4</sup> 3

JOUR 300	Introduction to Advertising
JOUR 302	Video Production
JOUR 310	News Reporting & Publishing
JOUR 319	Intro Photography
JOUR 321	Media Graphic Design
JOUR 374	Introduction to Public Relations
JOUR 407	Media Internship
JOUR 408	Media Practicum

*Intermediate Professional Courses*

Select at least 3 credits from the following:<sup>5</sup> 3

JOUR 306	Feature Writing
JOUR 312	Advertising/Copywriting
JOUR 314	Broadcast Reporting
JOUR 315	News 22
JOUR 317	News Editing
JOUR 320	Photojournalism
JOUR 330	TV News Shooting & Editing
JOUR 425	Media Planning and Buying

*Advanced/ Capstone Professional Courses*

Select at least one from the following:<sup>6</sup> 3

JOUR 427	Multimedia Publishing
JOUR 412	Documentary Photojournalism
JOUR 414	RTV Scriptwriting/Performance
JOUR 476	Public Relations Campaigns
JOUR 490	Advertising Campaigns

*Mass Communications Courses*

Select at least 3 credits from the following: 3

JOUR 350	Media History
JOUR 377V	Mass Media Ethics
JOUR 380	Women and the Media
JOUR 460	Public Relations Promotion in Sports
JOUR 484	Public Opinion
JOUR 489	Media Research
JOUR 494	Special Topics
JOUR 495	Mass Communication Theory
JOUR 499	Independent Study in Media

Select an additional 12 credits of non-core courses in the Journalism and Mass Communication department.<sup>2</sup> 12

**Credits outside the Journalism and Mass Communication department (72 total)**

*General Education Courses* 35

*Viewing a Wider World Courses* 6

*Electives: to bring total to 120* 40

**Second Language Requirement: (required- see below)**

Total Credits 120

<sup>1</sup> JOUR 102 Grammar for Journalists: for those with ACT English score below 25 or SAT below 570. Students must pass JOUR 102 Grammar for Journalists or have an ACT score of 25+ or 570+ SAT score prior to enrolling in basic writing classes, such as JOUR 110 Introduction to Media Writing, and higher writing-based JOUR courses and to earn a Journalism and Mass Communications Degree. However, students are allowed to take JOUR 110 Introduction to Media Writing while they are taking JOUR 102 Grammar for Journalists.

<sup>2</sup> Students must complete 24 credits of non-core courses, including at least one course from each category listed above. Entry into courses is subject to successful completion of appropriate prerequisites.

<sup>3</sup> All introductory classes, except JOUR 310 News Reporting & Publishing, do not require any prerequisite class to get into these classes. However, students must successfully finish JOUR 210 Newswriting & Reporting to get into JOUR 310 News Reporting & Publishing.

<sup>4</sup>

- JOUR 300 Introduction to Advertising and JOUR 374 Introduction to Public Relations: recommended for students specializing in advertising or public relations (PR);
- JOUR 302 Video Production: recommended for students specializing in broadcasting;
- JOUR 310 News Reporting & Publishing: recommended for students specializing in news editorial or multi-media;
- JOUR 319 Intro Photography: recommended for students specializing in photojournalism.

<sup>5</sup>

- JOUR 306 Feature Writing, and JOUR 317 News Editing : recommended for students specializing in news editorial or multi-media;
- JOUR 312 Advertising/Copywriting and JOUR 425 Media Planning and Buying: recommended for students specializing in advertising and PR;
- JOUR 314 Broadcast Reporting, JOUR 315 News 22, and JOUR 330 TV News Shooting & Editing: recommended for students specializing in broadcasting;
- JOUR 320 Photojournalism: recommended for students specializing in photojournalism.

<sup>6</sup>

- JOUR 412 Documentary Photojournalism: capstone class for students specializing in photojournalism;
- JOUR 414 RTV Scriptwriting/Performance: capstone class for students specializing in broadcasting;
- JOUR 427 Multimedia Publishing: capstone class for students specializing in news editorial or multi-media;
- JOUR 476 Public Relations Campaigns: capstone class for students specializing in PR;
- JOUR 490 Advertising Campaigns: capstone class for students specializing in advertising.

## Second Language Requirement

For the Bachelor of Arts in Journalism and Media Studies there is a one year second language requirement, the student must do one of the following:

### Option 1:

Complete two semesters from the following:

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

### For Heritage Learners:

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

**Option 3:**

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	

OR

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

**Option 4:**

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

**Option 5:**

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

**Option 6:**

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

**Option 7:**

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

**Option 8:**

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Journalism and Media Studies - Undergraduate Minor

Students may not earn both a Bachelor of Arts in Journalism and Mass Communications and minor in Journalism and Mass Communications.

**Required Courses**

JOUR 102	Grammar for Journalists <sup>1</sup>	2
JOUR 105G	Media and Society	3
JOUR 110	Introduction to Media Writing	3
JOUR 210	Newswriting & Reporting	3
Upper division JOUR courses		9
Total Credits		18

<sup>1</sup> JOUR 102 Grammar for Journalists: for those with ACT English score below 25 or SAT below 570; Note: students must pass JOUR 102 Grammar for Journalists or have an ACT score of 25+ or 570+ SAT score prior to enrolling in JOUR 110 Introduction to Media Writing, and higher writing-based JOUR courses and to earn a Journalism and Mass Communications Minor.

## Languages and Linguistics

### Undergraduate Program Information

Programs of study in the Department of Languages and Linguistics prepare students for a diverse number of professions and provide them with critical skills that compliment many careers in an increasingly interdependent and global marketplace. Students also increase their awareness of the important role language plays in human interaction on individual and global levels.

The major curriculum plans in each language include balanced groups of courses in language, linguistics, literature and culture. Students may choose to major, double major or minor in French, German or Spanish.

### Graduate Program Information

The Department of Languages and Linguistics offers a Master of Arts in Spanish, which may be completed through our program on the main campus or completely online. Students are asked to specialize in either linguistics or literature. For non-thesis students, a specialization consists of a minimum of 27 credit hours, for thesis students, a specialization consists of a minimum of 24.

### Admission Requirements

Admission requirements include a BA in Spanish. An undergraduate Grade Point Average (GPA) of 3.0 or above, which includes at least 12 semester hours of upper-division undergraduate courses in Spanish with a GPA of at least 3.0. Students must also satisfy general requirements of the Graduate School and submit the proper electronic online application and transcripts at the Graduate School website. Students must also complete a secondary admission packet (also submitted online through the Graduate School electronic application portal), which should include:

- A current resume (C.V.) in Spanish
- Three (3) letters of recommendation from qualified professionals (written within the last six months), preferably from past professors, that address the applicant's academic record.
- A writing sample in Spanish (critical or creative writing texts). If you do not have a six-page paper, you may submit multiple shorter works totaling six pages.
- A Language Evaluation Form (available for download at the departmental website) completed and signed by a qualified language evaluator. If you have an official ACTFL OPI rating certificate, this may be submitted in lieu of the Language Evaluation Form.
- An introductory letter in Spanish to include:
  - A brief biography of one or two paragraphs along with your goals and objectives for obtaining a Master's degree in Spanish
  - A statement of interest in either the residential (on-campus) program or the online program
  - A statement of your prospective area of interest (Linguistics or Literature), and
  - Your declaration of interest in being considered for a Graduate Teaching Assistantship (this option is only available for the residential [on-campus] program).

Only completed applications will be reviewed. Again, all materials should be submitted via the Graduate School electronic application portal. No materials should be sent directly to the department. Applying to the program does not guarantee admission to the program. It is the

applicant's responsibility to ensure that all materials have been submitted correctly.

Application deadlines: September 15 for admission for the following Spring semester (which begins in January), and January 15 for admission for the following Fall semester (which begins in August). Students will be advised upon their formal acceptance into the program.

## Department Requirements for a Minor in French, German, or Spanish

A minor requires 18 hours of course work in the target language.

## Degrees for the Department

Foreign Languages - Bachelor of Arts (p. 358)

Chicano Studies - Supplementary Major (p. 361)

Latin American Studies - Supplementary Major (p. 360)

Linguistics - Supplementary Major (p. 361)

Spanish - Master of Arts (p. 362)

## Minors for the Department

French - Undergraduate Minor (p. 359)

German - Undergraduate Minor (p. 359)

Linguistics - Undergraduate Minor (p. 359)

Spanish - Undergraduate Minor (p. 360)

### Professor, Glenn W. Fetzer, Department Head

**Professors** Fouillade, Garcia, MacGregor-Mendoza, Pollack; **Associate Professors** Herrera, Waltemire; **Assistant Professors** Deshors, Moreno, Wheeler; **College Professor** Longwell; **College Associate Professor** Buchenau; **College Assistant Professors** Pedersen, Zollner

*Longwell, Graduate Director, M.A. (New Mexico State University); J. M. Garcia, Ph.D. (Kansas); S. Herrera, Ph.D. (New Mexico); P. MacGregor-Mendoza, Ph.D. (Illinois-Urbana-Champaign); G. Moreno, Ph.D. (Arizona); B. Pollack, Ph.D. (California-Santa Barbara); M. Waltemire, Ph.D. (New Mexico); E. Wheeler, Ph.D. (California-Santa Barbara)*

## Chinese Courses

### CHIN 111. Elementary Chinese I 4 Credits

Mandarin Chinese for beginners.

### CHIN 112. Elementary Chinese II 4 Credits

Mandarin Chinese for beginners.

**Prerequisite:** C or better in CHIN 111.

### CHIN 211. Intermediate Chinese I 3 Credits

Speaking, reading and writing Mandarin Chinese. Restricted to Las Cruces campus only.

**Prerequisite(s):** C or better in CHIN 112.

### CHIN 212. Intermediate Chinese II 3 Credits

Speaking, reading and writing Mandarin Chinese. Restricted to Las Cruces campus only.

**Prerequisite(s):** C or better in CHIN 211.

### CHIN 311. Advanced Chinese Language I 3 Credits

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

**Prerequisite(s):** Grade of C or better in CHIN 211 and CHIN 212.

### CHIN 312. Advanced Chinese Language II 3 Credits

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

**Prerequisite(s):** Grade of C or better in CHIN 311.

## French courses

### FREN 111. Elementary French I 4 Credits

French language for beginners.

### FREN 112. Elementary French II 4 Credits

French language for beginners.

**Prerequisite:** C or better in FREN 111.

### FREN 211. Intermediate French I 3 Credits

Speaking, reading and writing.

**Prerequisite:** C or better in FREN 112.

### FREN 212. Intermediate French II 3 Credits

Speaking, reading and writing.

**Prerequisite:** C or better in FREN 211.

### FREN 306. Topics in French Culture and Civilization 3 Credits

Selected topics focusing on French culture and civilization. Topics identified in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**Prerequisite:** FREN 212 or consent of instructor.

### FREN 315. French Grammar 3 Credits

A thorough review of French grammar through the study of grammatical elements and the use of grammatical exercises.

**Prerequisite(s):** FREN 212 or consent of instructor.

### FREN 325. Intermediate Conversation 3 Credits

French conversation through intensive oral practice with emphasis on vocabulary acquisition and pronunciation.

**Prerequisite:** FREN 212 or consent of instructor.

**FREN 330. Business French****3 Credits**

An introduction to standard language within the corporate world in French-speaking countries. Students practice reading, writing, listening, speaking and expanding their vocabulary in professional fields related to business.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 341. Introduction to French Linguistics****3 Credits**

This course aims to introduce the basic concepts of contemporary linguistics and to show how the French language functions in regard to form and meaning.

**Prerequisite(s):** FREN 212.

**FREN 352. French Phonetics****3 Credits**

Systematic description of modern French pronunciation. Corrective exercises for foreign learners. Formal study of spelling/pronunciation relationships.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 360. French Cinema****3 Credits**

The evolution of contemporary French cinema. A critical understanding of film as an art form and as cultural expression.

**Prerequisite:** FREN 212 or consent of instructor.

**FREN 365V. Perspectives in French Culture****3 Credits**

Examines components of French culture through literature, films and other sources. Taught in English. Does not satisfy Arts and Sciences second language requirement. Does not satisfy French major or minor requirements.

**FREN 378. Studies in Francophone Cultures****3 Credits**

Studies of representative Francophone cultures through their history, literature, music and films.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 381. Survey of French Literature I****3 Credits**

Literary movements, authors and selected texts of the Middle Ages through the eighteenth century.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 382. Survey of French Literature II****3 Credits**

Literary movements, authors and selected texts of the nineteenth and twentieth centuries.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 385. French Civilization****3 Credits**

A detailed study of important events in French civilization from its origins to the twentieth century through the study and discussion of history, literature, fine arts and politics.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 386. Contemporary Women Writers in French****3 Credits**

Exploration of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 425. Advanced French Conversation****3 Credits**

Mastery of spoken French language through discussion of personal readings and group work to develop vocabulary, syntactical and conversational skills. The class is conducted entirely in French.

**Prerequisite(s):** FREN 325 or consent of instructor.

**FREN 449. Special Problems****1-3 Credits**

Directed reading for graduate students in specific field to satisfy language requirement for master's or doctoral programs.

**FREN 451. Special Topics in French****1-3 Credits**

Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**FREN 453. Independent Studies in French****1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**FREN 466. Introduction to French Linguistics****3 Credits**

This course aims to introduce the basic concepts of contemporary linguistics and to show the French language functions with regard to form and meaning. Consent of instructor required.

**Prerequisite(s):** Advanced level in French.

**FREN 471. The French Novel****3 Credits**

Development of the novel and analysis of selected texts with emphasis on the nineteenth and twentieth centuries.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 472. The French Short Story****3 Credits**

Study and discussion of French short stories through the ages.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 478. Studies in Francophone Cultures Around the World****3 Credits**

Advanced studies of representative Francophone cultures through their history, literature, music and films.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 486. Advanced Contemporary Women Writers in French****3 Credits**

Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

**Prerequisite(s):** FREN 212 or consent of instructor.

**German Courses****GER 111. Elementary German I****4 Credits**

German for beginners. Stress on speaking skills.

**GER 112. Elementary German II****4 Credits**

German for beginners and students with one year of high school German. Stress on speaking skills.

**Prerequisite:** C or better in GER 111.

**GER 211. Intermediate German I****3 Credits**

Speaking, reading and writing.

**Prerequisite:** C or better in GER 112.

**GER 212. Intermediate German II****3 Credits**

Speaking, reading and writing.

**Prerequisite:** C or better in GER 211.

**GER 305. Topics in German Culture****3 Credits**

Overview of Germany - states, cities, landscapes and people. May be repeated up to 6 credits.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 313. Intermediate Composition and Grammar****3 Credits**

Exercises in written German with emphasis on advanced grammatical features. Preparation for Zertifikat Deutsch.

**Prerequisite:** GER 212, or high school German 3, or consent of instructor.

**GER 325. German Conversation I****3 Credits**

Spoken German with emphasis on everyday situations.

**Prerequisite:** GER 212, or high school German 3, or consent of instructor.

**GER 330. Business German****3 Credits**

An introduction to standard language within the corporate world in German-speaking countries. During the semester, students will practice reading, writing, listening, speaking and expanding their vocabulary in the fields related to business, technology (ex. Engineering) and health (ex. Nursing, Psychology, etc.).

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 333V. German Culture through Cinema****3 Credits**

Events, values and issues in German culture as reflected in motion pictures made in Germany between 1913 and 1990. Familiarization with cinema as art form. Taught in English. Does not satisfy Arts and Sciences second language requirement.

**GER 340. German Linguistics****3 Credits**

Analysis of the German language.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 341. German Folklore and Culture****3 Credits**

Customs, traditions, mythology, folk literature and art; everyday culture of German-speaking Europe.

**Prerequisite:** GER 212 or equivalent or consent of instructor.

**GER 343. Readings in Current Events****3 Credits**

Practice in improving reading skills with a wide variety of texts.

Discussion in German also enhances oral skills.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 350. Introduction to German Literature****3 Credits**

Basic literary genres and major figures in German literature from the 18th century to the present.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 399. Intermediate Independent Study in German****1-3 Credits (1-3)**

Tutorial in reading, writing and oral expression. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 410. Practicum in Conversational German****1-3 Credits**

Intensive oral practice as language monitor. May be repeated for a maximum of 6 credits.

**Prerequisite:** two upper division German courses or consent of instructor.

**GER 413. Advanced Composition and Grammar****3 Credits**

Exercises in written German with emphasis on stylistic features.

**Prerequisite:** GER 313 or consent of instructor.

**GER 425. Advanced German Conversation****3 Credits**

Advanced conversation through intensive oral practice.

**Prerequisite(s):** GER 325 or consent of instructor.

**GER 449. Special Problems****1-3 Credits**

Directed reading for graduate students in their specific fields to satisfy language requirements for master's or doctoral programs. May be repeated for a maximum of 6 credits.

**GER 451. Special Topics in German****1-3 Credits**

Selected topics in German language, literature or area studies announced in Schedule of Classes. May be repeated for credit when topic changes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**GER 453. Independent Studies in German****1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students. May be repeated up to 12 credits.

**Prerequisite(s):** Consent of instructor.

**GER 471. Studies in German Literature****3 Credits**

Selected readings from authors representative of each literary period.

May be repeated up to 6 credits.

**Prerequisite(s):** GER 212 or consent of instructor.

**Language Courses****LANG 111. Beginning Language I****4 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.

**Prerequisite:** Language placement exam or consent of the instructor.

**LANG 112. Beginning Language II****4 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.

**Prerequisite:** Language placement exam or consent of instructor.

**LANG 211. Intermediate Language I****3 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles.

**LANG 212. Intermediate Language II****3 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles.

**Prerequisite:** Language placement exam or consent of instructor.

**LANG 451. Special Topics****1-3 Credits**

Selected topics relating to cultures or literatures of a specific country. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. May be repeated for a maximum of 12 credits. Consent of instructor required.

**LANG 453. Independent Studies****1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated under different subtitles for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**Linguistics Courses****LING 200G. Introduction to Language****3 Credits**

Traditional fields of language study (sound, grammar, meaning) and newer ones (language as social behavior, language and cognition, language variation, animal communication).

**LING 301. Introduction to Psycholinguistics****3 Credits**

Same as PSY 301.

**LING 302V. Language and Society****3 Credits**

Study of how social identity including such factors as ethnicity, age, sex, education, power and socio-economic class is expressed in language systems and how misunderstandings arise between groups. Research skills are emphasized.

**LING 303. Exploring Language Systems****3 Credits**

Forms of linguistic semantic, syntactic and phonological organization.

**Prerequisite(s):** LING 200G.

**LING 405. Topics in Linguistics****3 Credits**

Selected linguistics topics subtitled in the Schedule of Classes. May be repeated for a maximum of 6 credits under different subtitles.

**Prerequisite:** consent of instructor.

**LING 425. Language and the Mind: Introduction to Psycholinguistics****3 Credits**

This course is an introduction to psycholinguistics; the study of how humans learn, represent, comprehend and produce language. Throughout this course, we address a variety of questions on the psychology of language most of which are still being answered. These include: What does it mean to know a language? What are the cognitive processes involved in language use? How do we produce and recognize speech? How can we improve texts and make them easier to read? How can we control speech in special situations to avoid errors?

**Prerequisite(s):** LING 200G or consent of instructor.

**LING 451. Independent Studies in Linguistics****1-3 Credits**

Individual or group study of selected topics to be identified by subtitle.

May be repeated for a maximum of 6 credits.

**Prerequisites:** LING 200G and prior arrangement with faculty supervisor.

**LING 455. Research in Linguistics****3 Credits**

This course will provide a capstone experience for students who have progressed through the program in linguistics and provide the foundation for further study at the post-graduate level in a linguistics-related field.

Students will apply their foundation of knowledge and skills in linguistics through the realization of an individualized, inquiry-based project.

Consent of instructor may enroll student only in case of elective credit shortfall with concurrent enrollment.

**Prerequisite(s):** LING 200G, LING 301, LING 302V, LING 303, plus 9 credit hours of related electives.

**LING 500. Introduction to Linguistics****3 Credits**

Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics and some of the theoretical issues in the field.

**LING 502. Graduate Study in Sociolinguistics****3 Credits**

Study of how social identity including factors such as ethnicity, age, gender education and socio-economic class is expressed in language systems.

**Prerequisites:** LING 200G or LING 500 recommended.

**LING 503. Exploring Language Systems- Grad****3 Credits**

Students will be responsible for all requirements of LING 303 and will undertake independent, directed research.

**Prerequisite(s):** LING 200 or LING 500.

**LING 505. Selected Topics****3 Credits**

Studies, varying from year to year, in linguistics.

**Portuguese Courses****PORT 213. Portuguese for Romance Language Students I****3 Credits**

Introduction to the Portuguese language, Brazilian culture and civilization. Taught in Portuguese. Open to students with any previous Romance language study (French, Italian, Portuguese, Romanian, Spanish).

**PORT 214. Portuguese for Romance Language Students II****3 Credits**

Continuation of PORT 213.

**Prerequisite:** C or better in PORT 213 or consent of instructor.

**PORT 453. Independent Luso-Brazilian Studies****1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students in Luso-Brazilian studies. May be repeated up to 12 credits. Consent of Instructor required.

**PORT 513. Graduate Portuguese for Romance Language Students I****3 Credits**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

**PORT 514. Graduate Portuguese for Romance Language Students II**  
**3 Credits**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

**Prerequisite(s):** Language placement exam or C or better in PORT 513, or consent of instructor.

**Spanish Courses****SPAN 111. Elementary Spanish I****4 Credits (4)**

Spanish for beginners. Speaking and writing common interactions in predictable settings using basic vocabulary and verb tenses. Communicate in Spanish both orally and in writing sufficiently well so as to be able to make yourself understood by native speakers accustomed to dealing with non-native speakers. In spontaneous conversation and in writing, students will be able to produce a few sentences. **Prerequisite(s):** Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and/or assessment by departmental examination.

**SPAN 112. Elementary Spanish II****4 Credits (4)**

Spanish for beginners. Speaking and writing common interactions in predictable settings using basic vocabulary and verb tenses, including talking about events in the past and possible recommendations for the future. Communicate in Spanish both orally and in writing sufficiently well so as to be able to make yourself understood by native speakers accustomed to dealing with non-native speakers. In spontaneous conversation and in writing, students will be able to produce a variety of sentences and form context appropriate to open-ended questions. **Prerequisite(s):** Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and/or assessment by departmental examination or a C- or better in SPAN 111.

**SPAN 113. Spanish for Heritage Learners I****3 Credits**

Emphasis on development of heritage Spanish language skills learned at home and/or in the community. Covers listening comprehension, development of vocabulary and cultural activities to help strengthen heritage language and culture. Students who have previously earned a C or better in SPAN 111 or SPAN 112 may not receive credit for this course.

**SPAN 115. Elementary Spanish I for Hotel, Restaurant and Tourism Managers****4 Credits**

Beginning Spanish for HRTM majors only. Will count towards HRTM degree language requirement. Does not count towards language requirement for other majors. Restricted to: Main campus only. Restricted to HRTM majors.

**SPAN 211. Intermediate Spanish I****3 Credits (3)**

Speaking, reading and writing. Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and assessment by departmental examination or C or better in SPAN 112.

**SPAN 212. Intermediate Spanish II****3 Credits (3)**

Speaking, reading and writing. Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and assessment by departmental examination or C or better in SPAN 211.

**SPAN 213. Spanish for Heritage Learners II****3 Credits**

Emphasis on development of heritage language skills learned at home and/or in the community. Covers spoken Spanish, reading activities and grammar skills to build on existing knowledge of the language.

**SPAN 214. Spanish for Heritage Learners III****3 Credits**

Continued development of heritage Spanish language skills learned at home and/or in the community. Emphasis on reading, writing and critical thinking skills. Review of grammar points will also be stressed in preparation for upper level courses.

**SPAN 305. Topics in Hispanic Civilization****3 Credits (3)**

Group study of selected topics focusing on Hispanic culture and civilization. Topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**Prerequisite:** SPAN 212 or SPAN 214 or consent of instructor.

**SPAN 306. Special Topics****3 Credits**

Group study of Spanish for specialized purposes (e.g. court interpreting, professional language for bilingual teachers, technical writing for the business community). Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** SPAN 212 or SPAN 214 or consent of instructor.

**SPAN 312. Grammar for Heritage/Native Speakers of Spanish****3 Credits**

For students who have been exposed to Spanish at home or in the community. Review of grammatical concepts and analysis of both spoken and written Spanish. Students cannot receive credit for both SPAN 312 and SPAN 313.

**Prerequisite(s):** SPAN 214 or consent of instructor.

**SPAN 313. Spanish Grammar****3 Credits**

A review of the rules of Spanish grammar. Students cannot receive credit for both SPAN 312 and SPAN 313.

**Prerequisite:** SPAN 212 or SPAN 214 or consent of instructor.

**SPAN 314. Spanish Composition****3 Credits**

Development of written Spanish skills. Students cannot receive credit for both SPAN 314 and SPAN 315.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 315. Composition for Heritage/Native Speakers of Spanish****3 Credits**

Discussions of history, and current political and cultural topics pertaining to the Hispanic world. Emphasis on development of writing skills in formal Spanish. Students cannot receive credit for both SPAN 314 and SPAN 315. Fulfills departmental requirement for SPAN 314.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 325. Advanced Conversation****3 Credits (3)**

Intensive oral practice. Not open to heritage/native speakers of Spanish.

**Prerequisite(s):** SPAN 212 or consent of instructor.

**SPAN 327. Spanish in the Community****3 Credits**

Emphasis on use of Spanish outside the classroom in the local communities. Activities include but are not limited to oral histories, language mentoring in schools, assisting with cultural activities and language research.

**Prerequisite(s):** Basic communicative fluency in Spanish as determined by departmental advisor.

**SPAN 340. Introduction to Spanish Linguistics****3 Credits**

General aspects of Spanish linguistics: traditional, descriptive, historical and dialectal.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 350. Introduction to Chicano Studies****3 Credits**

Covers Mexican-American life including language, history, education, politics and literature.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 352. Spanish in Social Contexts****3 Credits**

The study of Spanish in the contexts of the societies in which it is spoken.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 353. Spanglish****3 Credits**

Covers lexical borrowing, code choice, language loss and maintenance, and bilingual cognition.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 360. Introduction to Latin American Studies****3 Credits**

Offers an introduction to topics in Latin American Studies including language, culture, literature, history, sociology and anthropology. Course is taught in English. Spanish majors and minors may receive credit towards degree requirements by submitting course work in Spanish (SPAN 312 or SPAN 313 recommended for SPAN majors or minors).

**SPAN 361. US-Mexico Border Culture- Literature and /or Culture****3 Credits**

Study of major authors and/or cultural trends in the U.S.-Mexico border. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 363. US-Hispanic Culture****3 Credits**

Study of major artistic and cultural trends among US-Hispanics. Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 6 credits under a different subtitle.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 364V. Culture and Civilization of Mexico****3 Credits**

Familiarization with culture, civilization and regions of Mexico. History, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Mexican culture and civilization on the Southwest United States. Taught in English. Does not satisfy Arts and Sciences second language requirement.

**SPAN 365V. Culture and Civilization of Spanish America****3 Credits**

Familiarization with culture, civilization and regions of Spanish America. Study of history, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Spanish American culture and civilization on the Southwest United States. Taught in English. Does not satisfy College of Arts and Sciences second language requirement.

**SPAN 380. Introduction to Hispanic Literature****3 Credits**

Works in Spanish, all genres and periods. How to read literature in all forms.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 385. Introduction to Chicano/US-Mexican Literature****3 Credits**

Introduction to the study of major works by Chicano/US-Mexican authors.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 388. Contemporary Hispanic Literature****3 Credits**

Study of Peninsular and Spanish-American literature from the 20th century to the present.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 393. Introduction to Translation and Interpretation****3 Credits**

General aspects of translation and interpretation from English to Spanish and Spanish to English. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 399. Independent Studies in Literature, Language, or Culture****1-3 Credits**

Individualized, self-paced projects for advanced students. Students must present formal proposal of study. May be repeated for a maximum of 6 credits.

**Prerequisite:** SPAN 312 and SPAN 313.

**SPAN 410. Mitos y Leyendas Indigenas****3 Credits**

Survey in Spanish language of indigenous poetry, myths and legends from Pre-Columbian times to present.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 411. Creative Writing****3 Credits**

Creative writing in Spanish.

**Prerequisite(s):** SPAN 314 or SPAN 315 and SPAN 380.

**SPAN 412. Spanish-American Poetry****3 Credits**

Study of major works by Spanish-American poets.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 415. Spanish-American Women Writers****3 Credits**

All genres of Spanish-American literature written by women.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 416. Nineteenth Century Spanish-American Literature****3 Credits**

Study of major works by Spanish-American authors of the 19th century.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 418. Spanish-American Short Story****3 Credits**

Study of major short stories by Spanish-American authors.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 419. Spanish American Drama****3 Credits**

Study of major works by Spanish-American dramatists.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 420. Hispanic Micro Fiction****3 Credits**

Study of micro fiction works by Hispanic Authors and creative writing workshop related to micro fiction.

**Prerequisite(s):** SPAN 314 or SPAN 315 and SPAN 380.

**SPAN 421. Culture and Literature of New Mexico****3 Credits**

The study of the development and flourishing of New Mexican culture and literature.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 422. Literature of the Mexican Revolution****3 Credits**

Study of Mexican authors dealing with the Mexican Revolution.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 424. Post-Modern Hispanic Literature****3 Credits**

The study of Post-Modern experimental literary genres, from Post-boom to the present.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 425. Conquest, Colonial and Indigenous Literatures****3 Credits**

The study of literary and cultural works of the Spaniard Conquest and Latin American Indigenous cultures.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 426. Spanish-American Novel****3 Credits**

Study of major works by Spanish-American novelists.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 427. Chicano Literature****3 Credits**

Study of Chicano/US-Mexican authors.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 439. Topics in Applied Spanish Linguistics****3 Credits**

Group study of selected topics to be identified by subtitle in the Schedule of Classes. May be repeated once under different subtitle for a maximum of 6 credits.

**Prerequisite:** SPAN 340.

**SPAN 447. Hispanic Film****3 Credits**

Study of major films from Spain and Spanish-America. Restricted to: Main campus only.

**SPAN 448. U.S.-Hispanic Film****3 Credits**

Study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

**SPAN 449. Special Problems****1-3 Credits**

Directed reading for graduate students in their specific fields to satisfy language requirement for master's or doctoral programs. May be repeated for a maximum of 6 credits.

**SPAN 450. Mexican Cultures****3 Credits**

Different aspects of Mexican Culture. Selected topic to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 6 credits under a different subtitle.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 451. Hispanic Cultures****3 Credits**

Issues in Hispanic cultures of the U.S., Spanish-America and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 457. Strategies for Teaching Spanish for Heritage/Native Speakers****3 Credits**

Overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers. Taught with SPAN 597.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 460. Spanish Language Acquisition****3 Credits**

Research and theories of acquisition of Spanish as a first or second language.

**Prerequisite:** LING 200 or SPAN 340, or consent of instructor.

**SPAN 461. Introduction to Spanish Phonetics****3 Credits**

An introduction to Spanish phonetics including basic dialectal variation and comparison with English.

**Prerequisite:** SPAN 340.

**SPAN 470. Methods for Teaching Literature to Spanish Heritage Learners****3 Credits**

Current methods for teaching literature to Spanish for Heritage Learners (SHL).

**Prerequisite(s):** SPAN 314 or SPAN 315 and SPAN 380.

**SPAN 490. Special Topics****3 Credits**

Selected topic to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 491. History of the Spanish Language****3 Credits**

The development of Spanish from its origins.

**Prerequisite(s):** SPAN 340.

**SPAN 492. Structure of Spanish****3 Credits**

Topics in Spanish linguistics including phonology, morphology, syntax and semantics.

**Prerequisite(s):** SPAN 314 or SPAN 315 or SPAN 340.

**SPAN 493. Studies in U.S. Spanish****3 Credits**

Linguistic issues and studies of U.S. Spanish-speaking communities. Taught with SPAN 593.

**Prerequisite(s):** SPAN 340.

**SPAN 500. Methods of Research and Literary Criticism****3 Credits**

Advanced methods of research and literary criticism.

**SPAN 507. Technology Enhanced Language Learning****3 Credits**

Strategies for enhancing language learning with emerging technologies.

Course is taught in Spanish.

**SPAN 508. Teaching Literature with Technology****3 Credits**

Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/

**Prerequisite(s):** SPAN 507, and/or consent of instructor.

**SPAN 509. Teaching Culture with Technology****3 Credits**

Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/

**Prerequisite(s):** SPAN 507, and/or consent of instructor.

**SPAN 510. Assessing the National Standards****3 Credits**

Analysis of the National Standards for Foreign Language Learning (the 5 Cs) in the 21st Century. Course will also cover the Integrated Performance Assessment as applied to the national standards. Other assessments will be reviewed to evaluate effectiveness in all levels of Spanish language classrooms.

**SPAN 512. Contemporary Spanish-American Poetry****3 Credits**

Readings and interpretation of Spanish-American poetry from the 20th century to the present.

**SPAN 520. Hispanic Micro Fiction****3 Credits**

Advanced study of micro fiction works by Hispanic Authors and creative writing workshop related to micro fiction.

**SPAN 521. Advanced Culture and Literature of New Mexico****3 Credits**

The advanced study of the development and flourishing of New Mexican culture and literature.

**SPAN 528. Advanced U.S. Latino Culture and Literature****3 Credits**

The advanced study of major works by Latino writers in the U.S.

**SPAN 540. Introduccion a la Linguistica****3 Credits**

Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change.

**Prerequisite(s):** Eligibility to take graduate level courses.

**SPAN 545. Advanced Dialectos del Espanol****3 Credits**

Advanced research of Spanish dialects including their formal characteristics, historical formation and regional variation.

**SPAN 547. Advanced Hispanic Film****3 Credits**

Advanced study of major films from Spain and Spanish-America. Restricted to: Main campus only.

**SPAN 548. Advanced U.S.-Hispanic Film****3 Credits**

Advanced study of major films about and/or by Hispanics of the U.S.

Restricted to: Main campus only.

**SPAN 551. Advanced Hispanic Cultures****3 Credits**

Advanced study on Hispanic cultures of the U.S., Spanish-America and/or Spain. Selected topic to be identified by subtitle. Taught with SPAN 451.

May be repeated up to 6 credits.

**SPAN 552. Advanced Literature of the Mexican Revolution****3 Credits**

Study of Mexican authors dealing with the Mexican Revolution.

Restricted to: Main campus only.

**SPAN 555. Advanced Conquest, Colonial and Indigenous Literatures****3 Credits**

The advanced study of literary and cultural works of the Spaniard

Conquest and Latin American Indigenous cultures.

**SPAN 556. Advanced 19-Century Spanish-American Literature****3 Credits**

Study of major works by Spanish-American authors of the 19th century.

**SPAN 558. Bilinguismo****3 Credits**

Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence.

**Prerequisite(s):** SPAN 540 or consent of instructor.

**SPAN 560. Advanced Spanish Language Acquisition****3 Credits**

Advanced research and theories of acquisition of Spanish as a first or second language.

**Prerequisite(s):** SPAN 540.

**SPAN 561. Advanced Spanish Phonetics****3 Credits**

Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.

**SPAN 562. Advanced Spanish Phonology****3 Credits**

An advanced formal examination of the sound system of Spanish including formal characterizations, dialectal variation and laboratory data.

**SPAN 563. Advanced Study in Mexican Literature****3 Credits**

Mexican literature from the Pre-Columbian period to the present.

**SPAN 564. Advanced Post-Modern Hispanic Literature****3 Credits**

The advanced study of Post-Modern experimental literary genres, from Post-boom to the present.

**SPAN 566. Contemporary Spanish-American Novel****3 Credits**

The Spanish-American novel from the 20th century to the present.

**SPAN 567. Advanced Study in Chicano Literature****3 Credits**

Study of all genres of Chicano literature.

**SPAN 570. Advanced Study in Technical Translation****3 Credits**

Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.

**SPAN 573. Advanced Study in Creative Writing****3 Credits**

Advanced creative writing in Spanish.

**SPAN 580. Research Methodology in Spanish Linguistics****3 Credits**

Study and practical application of techniques in linguistic research.

**SPAN 583. Advanced Study in Spanish-American Women Writers****3 Credits**

All genres of Spanish-American literature written by women. Research paper required.

**SPAN 584. Spanish Morphosyntax****3 Credits**

Examination of the morphological and syntactic structure of the Spanish language as well as their interaction. Practical applications are also explored.

**SPAN 585. Language Assessment****3 Credits**

Introduces students to theoretical principles of and analytical techniques for language assessment. Students will learn to critically analyze existing language assessment measures and will develop, pilot test and analyze measures of their own.

**Prerequisite(s):** SPAN 540 or SPAN 560 or SPAN 580 or consent of instructor.

**SPAN 586. Contemporary Spanish-American Essay****3 Credits**

Main currents in the Spanish-American thought from the 20th century to the present.

**SPAN 587. Contemporary Spanish-American Short Story****3 Credits**

The Spanish-American short story from the 20th century to the present.

**SPAN 588. Contemporary Spanish-American Drama****3 Credits**

The Spanish-American drama from the 20th century to the present.

**SPAN 589. Spanish Sociolinguistics****3 Credits**

Relationship between language and society in the Spanish-speaking world.

**SPAN 590. Advanced Special Topics****3 Credits (3)**

Specific subject to be announced in the Schedule of Classes. May be repeated up to 6 credits.

**SPAN 591. Advanced Study in History of the Spanish Language****3 Credits**

The development of Spanish from its origins.

**SPAN 592. Advanced Structure of Spanish****3 Credits**

Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.

**SPAN 594. Theory and Methodology of Spanish Pedagogy****3 Credits**

Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.

**SPAN 595. Advanced Topics in Applied Spanish Linguistics****3 Credits**

Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.

**SPAN 597. Advanced Strategies for Teaching Spanish for Heritage/Native Speakers****3 Credits**

Advanced overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers.

**SPAN 598. Independent Reading, Research, and/or Creative Writing****1-3 Credits**

Individual study of selected readings and problems; or individual research, either analytical or experimental, or creative writing. May be repeated for unlimited credits.

**SPAN 599. Master's Thesis****15 Credits**

Thesis.

**Phone:** (575) 646-3408

**Website:** <http://www.nmsu.edu/~langling/>

## Foreign Languages - Bachelor of Arts Departmental Requirements for Majors

- Select at least one option: French, Spanish or German
- Complete LING 200G Introduction to Language
- Complete a second language through the 212 level (214 in Portuguese or Spanish for Heritage Speakers)
- Viewing a Wider World courses ( GER 333V German Culture through Cinema, SPAN 364V Culture and Civilization of Mexico, SPAN 365V Culture and Civilization of Spanish America) do not satisfy requirements for a major in Foreign Languages
- Electives sufficient to bring the total number of credits to 120, including 48 upper-division credits

## Departmental Requirements for Double Majors

A double major means a major in a department outside Languages and Linguistics in combination with a major in Foreign Languages. Students with double majors are exempt from LING 200G Introduction to Language and second language requirement.

- Viewing a Wider World courses ( GER 333V German Culture through Cinema, SPAN 364V Culture and Civilization of Mexico, SPAN 365V Culture and Civilization of Spanish America) do not satisfy the requirement for a double major in Foreign Languages
- Electives sufficient to bring the total number of credits to 120, including 48 upper-division credits

## Concentration: French Requirements

24 FREN credits (at least one class each in the following areas):

### Requirements

*Language Studies*

Select at least one from the following: 3

FREN 315	French Grammar	3
FREN 325	Intermediate Conversation	
FREN 352	French Phonetics	
FREN 425	Advanced French Conversation	
FREN 466	Introduction to French Linguistics	

*Culture*

Select at least one from the following: 3

FREN 306	Topics in French Culture and Civilization	3
FREN 360	French Cinema	
FREN 378	Studies in Francophone Cultures	
FREN 478	Studies in Francophone Cultures Around the World	

*Literature*

Select at least one from the following: 3

FREN 381	Survey of French Literature I	3
FREN 382	Survey of French Literature II	
FREN 386	Contemporary Women Writers in French	
FREN 471	The French Novel	
FREN 472	The French Short Story	
FREN 486	Advanced Contemporary Women Writers in French	

Select 3 additional credits at the FREN 400 level. Other courses may be selected with the help of an advisor. 3

Select 12 additional credits from FREN courses 12

Total Credits 24

## Concentration: German

**Requirements**

Select 24 credits from GER 300 or 400 level with the aid of an advisor. 24

Total Credits 24

## Concentration: Spanish

**Requirements**

24 SPAN credits at either the 300 or 400 level from each of the following: of which at least 6 credits must be at the 400 level.

**Requirements**

SPAN 312	Grammar for Heritage/Native Speakers of Spanish	3
or SPAN 313	Spanish Grammar	
SPAN 314	Spanish Composition	3
or SPAN 315	Composition for Heritage/Native Speakers of Spanish	
SPAN 340	Introduction to Spanish Linguistics	3
SPAN 380	Introduction to Hispanic Literature	3

*Linguistics/Methodology*

Select one from the following: 3

SPAN 327	Spanish in the Community	3
SPAN 457	Strategies for Teaching Spanish for Heritage/Native Speakers	
SPAN 461	Introduction to Spanish Phonetics	

SPAN 491	History of the Spanish Language	3
SPAN 493	Studies in U.S. Spanish	

*Literature/Culture*

Select one from the following: 3

SPAN 385	Introduction to Chicano/US-Mexican Literature	3
SPAN 388	Contemporary Hispanic Literature	
SPAN 447	Hispanic Film	
SPAN 448	U.S.-Hispanic Film	
SPAN 450	Mexican Cultures	

**Electives**

Select 6 credits from SPAN 300 or 400 level courses <sup>1</sup> 6

Total Credits 24

<sup>1</sup> SPAN 364V Culture and Civilization of Mexico and SPAN 365V Culture and Civilization of Spanish America do not count, as they are taught in English.

## French - Undergraduate Minor

Students must pass at least 18 credits of FREN courses of which at least 12 credits are upper division. Students may not count FREN 111 Elementary French I or FREN 112 Elementary French II, but may count FREN 211 Intermediate French I and/or FREN 212 Intermediate French II. A student whose primary language for a Bachelor of Arts in Foreign Languages is French may not also earn a minor in French.

**Required Courses**

One upper division course in French or Francophone Culture	3
One upper division course in French language studies	3
One upper division course in French or Francophone Literature	3
One additional upper-division class in one area above	3
Select 9 additional credits from French courses chosen with the help of an advisor	9
Total Credits	21

## German - Undergraduate Minor

Students must pass at least 18 credits of GER courses of which at least 12 credits are upper division. Students may not count GER 111 Elementary German I or GER 112 Elementary German II, but may count GER 211 Intermediate German I and/or GER 212 Intermediate German II. A students whose primary language for a Bachelor of Arts in Foreign Languages is German may not also earn a minor in German.

**Required Courses**

Select at least 18 credits of GER courses of which at least 12 credits are upper division	18
Total Credits	18

## Linguistics - Undergraduate Minor

The department offers a minor in linguistics.

**Required Courses**

LING 200G	Introduction to Language	3
Select two from the following:		6

LING 301	Introduction to Psycholinguistics	
LING 302V	Language and Society	
LING 303	Exploring Language Systems	
Select 9 credits with the help of an advisor from related fields <sup>1</sup>		9
<b>Total Credits</b>		<b>18</b>

<sup>1</sup> See list of electives for the supplementary major in Linguistics.

## Spanish - Undergraduate Minor

Students must pass at least 18 credits of SPAN courses of which at least 12 credits are at either the 300 or 400 level. Students may not count SPAN 111 Elementary Spanish I or SPAN 112 Elementary Spanish II, but may count SPAN 211 Intermediate Spanish I and/or SPAN 212 Intermediate Spanish II. A student whose primary language for a Bachelor of Arts in Foreign Languages is Spanish may not also earn a minor in Spanish.

### Required Courses

SPAN 312	Grammar for Heritage/Native Speakers of Spanish	3
or SPAN 313	Spanish Grammar	
SPAN 314	Spanish Composition	3
or SPAN 315	Composition for Heritage/Native Speakers of Spanish	

### Electives

Select 12 credits from SPAN 300 or 400 level courses <sup>1</sup>		12
<b>Total Credits</b>		<b>18</b>

<sup>1</sup> Up to 6 elective credits may be at the 200 level. SPAN 364V Culture and Civilization of Mexico and SPAN 365V Culture and Civilization of Spanish America do not count for a minor in Spanish as they are taught in English.

## Latin American Studies - Supplementary Major

This program consists of 24 credits drawn from the lists below of which 18 credits must be numbered 300 or above. In addition, students must satisfy the College of Arts and Sciences Second Language Requirement.

### Options

There are two options based on the section chosen by the student:

#### Option 1

Concentration in Latin American Language, Culture and Literature (Spanish or Portuguese):

- 12 credits from Section 1
- 12 credits from Section 2, (*Note: No more than 6 credits may be taken in a single department*)

#### Option 2

Concentration in one major (e.g., history, government, economics, health science, anthropology, sociology) included in Latin American Social Sciences and Art:

- 12 credits in the chosen area of Section 2 (if the major is government, one of these courses may be ECON 325V Economic Development of Latin America)
- 6 credits from another area (or areas) of Section 2
- 6 credits from Section 1

Both options require that the student take at least two Spanish or Portuguese courses above 300-level.

## Section 1: Latin American Language, Culture and Literature

Only 3 credits will count.

### Spanish/Portuguese Language

Select one from the following:		3
SPAN 325	Advanced Conversation	
SPAN 327	Spanish in the Community	
PHLS 461	Health Disparities: Determinants and Interventions	

### Culture

SPAN 305	Topics in Hispanic Civilization	3
SPAN 306	Special Topics	3
SPAN 363	US-Hispanic Culture	3
SPAN 450	Mexican Cultures	3
SPAN 491	History of the Spanish Language	3

### Literature

SPAN 388	Contemporary Hispanic Literature	3
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## Section 2: Latin American Social Sciences and Art

### Course List

ANTH 306V	Peoples of Latin America	3
ANTH 307	Anthropology of Mexico and Guatemala	3
ANTH 312	The Ancient Maya	3
ANTH 313	Ancient Mexico	3
ART 320	Art and Architecture in Pre-Columbian Meso-America	3
ART 321	Pre-Columbian Art and Architecture of the Andes	3
ECON 324V	Developing Nations	3
ECON 325V	Economic Development of Latin America	3
GEOG 328V	Geography of Latin America	3
GOVT 371	Latin American Politics	3
GOVT 378	U.S.-Mexico Border Politics	3
GOVT 379	Mexican Politics	3
HIST 311V	Colonial Latin America	3
HIST 312V	Modern Latin America	3
HIST 331	Rebels, Guerrillas, and Terrorists in Modern Latin America	3
HIST 353	Colonial Mexico	3
HIST 354	Modern Mexico	3
HIST 356	The Mexican Revolution	3
HIST 387	Spain	3
HIST 453	Cuba: Colony to Castro	3

HIST 459	Peru: From Incas to Inca Kola	3
PHLS 462	Hispanic Health Issues	3
PHLS 465	International Health Problems	3
PHLS 469	U.S.-Mexico Border Health Issues	3
PORT 453	Independent Luso-Brazilian Studies	1-3
SOC 361V	Social Issues in the Rural Americas	3
SOC 479	Sociology Perspectives on the U.S.-Mexico Border	3
SPAN 364V	Culture and Civilization of Mexico	3
SPAN 365V	Culture and Civilization of Spanish America	3
SPAN 410	Mitos y Leyendas Indigenas	3
SPAN 412	Spanish-American Poetry	3
SPAN 415	Spanish-American Women Writers	3
SPAN 416	Nineteenth Century Spanish-American Literature	3
SPAN 418	Spanish-American Short Story	3
SPAN 419	Spanish American Drama	3
SPAN 421	Culture and Literature of New Mexico	3
SPAN 422	Literature of the Mexican Revolution	3
SPAN 424	Post-Modern Hispanic Literature	3
SPAN 425	Conquest, Colonial and Indigenous Literatures	3
SPAN 426	Spanish-American Novel	3
SPAN 447	Hispanic Film	3

In both sections, independent studies, honors or special topics courses may be chosen with the approval of the Supplementary Major in Latin American Studies advisor, the head of the Department of Languages and Linguistics, and the College of Arts and Sciences. As departments add new courses they may be included in the program.

## Chicano Studies - Supplementary Major

This program consists of 24 credits from the lists below. Advisor: Dr. Spencer R. Herrera, Languages and Linguistics.

### Core Requirements

Select three from the following:	9
SPAN 327	Spanish in the Community
SPAN 448	U.S.-Hispanic Film
HIST 369	History of Latinos in the United States
SOC 470	Sociology of Latinos/as in the United States
SPAN 350	Introduction to Chicano Studies

### Culture and Literature

Select two from the following:	6
ART 320	Art and Architecture in Pre-Columbian Meso-America
ENGL 339V	Chicana/o Literature
ENGL 394V	Southwestern Literature
ENGL 458	Latino/a Literature and Culture
SPAN 361	US-Mexico Border Culture- Literature and /or Culture

SPAN 385	Introduction to Chicano/US-Mexican Literature
SPAN 427	Chicano Literature
SPAN 450	Mexican Cultures
SPAN 451	Hispanic Cultures
SPAN 470	Methods for Teaching Literature to Spanish Heritage Learners
Applicable upper-division honors courses	
Applicable upper-division "special topics" courses	
<b>Social Studies</b>	
Select 6 credits from the following:	6
C J 414	Race, Crime and Justice
C J 451	Border Violence and Justice
GOVT 378	U.S.-Mexico Border Politics
GOVT 399	New Mexico Law
HIST 261	New Mexico History
HIST 369	History of Latinos in the United States
HIST 400	Special Topics
HIST 410	New Mexico History for Educators
SOC 371	Race and Ethnic Relations
SPAN 353	Spanglish
SPAN 361	US-Mexico Border Culture- Literature and /or Culture
SPAN 493	Studies in U.S. Spanish
Applicable upper-division honors courses	
Applicable upper-division "special topics" courses	
<b>Electives</b>	
Select one from the following:	3
ANTH 313	Ancient Mexico
C EP 517	Multicultural Counseling <sup>1</sup>
EDUC 315	Multicultural Education
EDUC 344	Issues in Schooling for Bilingual Learners
ENGL 394V	Southwestern Literature
GEOG 325V	New Mexico and the American West
GOVT 399	New Mexico Law
HIST 311V	Colonial Latin America
HIST 483	Historic Preservation
PHLS 462	Hispanic Health Issues
PHLS 469	U.S.-Mexico Border Health Issues
SPAN 457	Strategies for Teaching Spanish for Heritage/Native Speakers
W S 454	Women Crossing Borders
Total Credits	24

<sup>1</sup> Only with prior written permission of instructor, department head and course dean.

Independent study, honors or special topics courses may be chosen with the approval of the advisor for Supplementary Majors in Chicano Studies, the head of the Department of Languages and Linguistics, and the College of Arts and Sciences. As departments add new courses they may be included in the program.

## Linguistics - Supplementary Major

This program consists of 24 credits drawn from the lists below. In addition, students must satisfy the College of Arts and Sciences Second Language Requirement. Advisor: Dr. Patricia MacGregor-Mendoza, Languages and Linguistics.

### Core Requirements

LING 200G	Introduction to Language	3
LING 301	Introduction to Psycholinguistics	3
LING 302V	Language and Society	3
LING 303	Exploring Language Systems	3

### Electives

Select 12 credits from the following: <sup>1</sup> 12

ANTH 320	Anthropological Linguistics	
C D 374	American Sign Language I	
C D 375	American Sign Language II	
C D 476	American Sign Language III	
C S 409	Independent Study <sup>2</sup>	
C S 471	Programming Language Structure I	
C S 479	Special Topics <sup>2</sup>	
COMM 305	Communication Research Methods	
COMM 351	Persuasion Theory and Practice	
COMM 370	Organizational Communication	
COMM 376	Communication and Culture	
COMM 384	Interpersonal Communication	
COMM 440	Political Communication	
COMM 450	Technologies of Human Communication	
COMM 460	Deception and Communication	
COMM 465	Nonverbal Communication	
COMM 475	International Communication	
COMM 480	Health Communication	
COMM 484	Verbal Communication	
COMM 490	Independent Study <sup>2</sup>	
COMM 491	Selected Topics <sup>2</sup>	
EDUC 483	Second Language Acquisition	
ENGL 451	Practicum in the Grammar of American English	
ENGL 452	History of the English Language	
FREN 352	French Phonetics	
GER 451	Special Topics in German <sup>2</sup>	
GER 453	Independent Studies in German <sup>2</sup>	
LING 451	Independent Studies in Linguistics <sup>2</sup>	
PHIL 312	Formal Logic	
PHIL 315	Philosophy of Language	
PHIL 346	Philosophy of Mind	
PORT 453	Independent Luso-Brazilian Studies <sup>2</sup>	
PSY 401	Directed Readings <sup>2</sup>	
SPAN 340	Introduction to Spanish Linguistics	
SPAN 352	Spanish in Social Contexts	
SPAN 353	Spanglish	
SPAN 439	Topics in Applied Spanish Linguistics	
SPAN 460	Spanish Language Acquisition	
SPAN 461	Introduction to Spanish Phonetics	
SPAN 491	History of the Spanish Language	

SPAN 492	Structure of Spanish	
SPAN 493	Studies in U.S. Spanish	
Total Credits		24

<sup>1</sup> At least 3 hours must be at the 400 level. No more than 6 hours may be from the department where the student is obtaining his/her major.

<sup>2</sup> Special topics, independent studies, and directed readings must be approved by the Department of Languages and Linguistics.

## Spanish - Master of Arts

The degree plan requires a minimum of 36 credits in Spanish, of which at least 30 must be earned at the 500 level, and the remainder above the 450 level. The courses should be concentrated in the student's chosen area of study (linguistics or literature) as each student will be tested on a reading list that corresponds to each area study. A thesis is optional. Students authorized to complete a thesis may count a maximum of 6 credits of thesis work toward the degree. At the present time, the thesis option is not available for online-only students. There are no required core courses at this time and a student should work closely with his/her advisor and the Graduate Director to establish an appropriate individual degree plan.

All students in either the on-campus or online program may complete a minor at the master's level by taking 9 credits (3 courses) at the 500 level or above, in another area (department) of study, or within the department itself. For instance, a student studying linguistics may wish to obtain a minor in literature or a student studying literature may wish to obtain a minor in linguistics. In either case, the minor credits count as part of the 36 total credits required for the degree. In all cases, the student should work closely with the Graduate Director to ensure his/her particular plan of study is acceptable to the program.

### Area of Study: Linguistics

Select 12 from the following: 36

SPAN 507	Technology Enhanced Language Learning	
SPAN 508	Teaching Literature with Technology	
SPAN 509	Teaching Culture with Technology	
SPAN 510	Assessing the National Standards	
SPAN 540	Introduccion a la Linguistica	
SPAN 545	Advanced Dialectos del Espanol	
SPAN 558	Bilinguismo	
SPAN 560	Advanced Spanish Language Acquisition	
SPAN 561	Advanced Spanish Phonetics	
SPAN 562	Advanced Spanish Phonology	
SPAN 570	Advanced Study in Technical Translation	
SPAN 580	Research Methodology in Spanish Linguistics	
SPAN 584	Spanish Morphosyntax	
SPAN 585	Language Assessment	
SPAN 589	Spanish Sociolinguistics	
SPAN 591	Advanced Study in History of the Spanish Language	
SPAN 592	Advanced Structure of Spanish	
SPAN 594	Theory and Methodology of Spanish Pedagogy	

SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers	
Total Credits		36

## Area of Study: Literature

Select 12 from the following:		36
SPAN 500	Methods of Research and Literary Criticism	
SPAN 512	Contemporary Spanish-American Poetry	
SPAN 520	Hispanic Micro Fiction	
SPAN 521	Advanced Culture and Literature of New Mexico	
SPAN 528	Advanced U.S. Latino Culture and Literature	
SPAN 547	Advanced Hispanic Film	
SPAN 548	Advanced U.S.-Hispanic Film	
SPAN 552	Advanced Literature of the Mexican Revolution	
SPAN 555	Advanced Conquest, Colonial and Indigenous Literatures	
SPAN 556	Advanced 19-Century Spanish-American Literature	
SPAN 563	Advanced Study in Mexican Literature	
SPAN 564	Advanced Post-Modern Hispanic Literature	
SPAN 566	Contemporary Spanish-American Novel	
SPAN 567	Advanced Study in Chicano Literature	
SPAN 573	Advanced Study in Creative Writing	
SPAN 583	Advanced Study in Spanish-American Women Writers	
SPAN 586	Contemporary Spanish-American Essay	
SPAN 587	Contemporary Spanish-American Short Story	
SPAN 588	Contemporary Spanish-American Drama	
Total Credits		36

Courses that may apply to either area include SPAN 590 Advanced Special Topics (see subtitles in schedule of courses to confirm subject of the course) SPAN 598 Independent Reading, Research, and/or Creative Writing, SPAN 599 Master's Thesis (both courses require a course proposal and prior approval).

## Additional Language Requirement

For both the on-campus and online degrees, the department requires that students fulfill a second language requirement (in addition to English and Spanish) by following an approved course of study. Typically, this is completed by taking a four-semester course of study, but may vary according to the languages available.

Options for completing this requirement include taking classes at a local Community College or University, or online. Some students have met this requirement by studying abroad through NMSU. Students should consult the Graduate Director to establish a plan and discuss how this requirement will be met. *Note: evidence of fulfilling the second language requirement must be provided to the Graduate Director BEFORE taking final examinations.*

## English Language Requirement

International students are required to demonstrate proficiency in English and meet all international admissions requirements prior to beginning their program of study. Please see the section of the Graduate Catalog on international admissions requirements and scores required for either the TOEFL or IELTS exam. *Note: evidence of fulfilling the English Language Requirement must be provided to the Graduate Director AND the Graduate School BEFORE taking final examinations.*

## Final Examinations

Students must successfully complete a final department examination (generally during the final semester of coursework) that is partially written and partially oral. Please consult the Graduate Director for specific information on dates and format for these exams. Final examinations are only available during the Fall and Spring semesters.

## Areas of Interest/Reading List

As stated previously, each student needs to select an area of interest: Linguistics or Literature. At the end of the student's degree, the final examinations (written and oral) will be based on the readings from the readings list in the student's selected area of study. For example, a student that has opted to specialize in literature is responsible for reading all the materials on the Literature Reading List. Likewise, a student that has opted to specialize in linguistics is responsible for reading all the materials on the Linguistics Reading List. The student is responsible for the reading list that was in place the year he or she started the program.

Each student is responsible for covering the reading materials listed. Please contact the Graduate Director for a detailed reading. Note that the list is dated, so make sure to refer to the correct list that covers the year/semester the student started the program. The student is responsible for covering ALL the readings even if the student did not cover them as part of work done in class.

## Graduate Assistantships

For the on-campus program only, the department awards graduate assistantships to qualified students. For this financial assistance, the student works up to 20 hours a week in departmental programs, chiefly in the teaching of elementary and intermediate Spanish courses in either the Heritage Language sequence or Spanish as a second Language sequence. Students interested in being considered for an assistantship should clearly state this interest in their introduction letter during the application process. The department offers a limited number of assistantships, and students should remember that not everyone that applies for this award receives one. Maintaining the award depends on the student's successful performance both academically and in the classes he/she teaches and is evaluated on a semester-by-semester basis. Students who receive an assistantship are required to take SPAN 594 Theory and Methodology of Spanish Pedagogy (see course description) as part of their degree plan in order to help them prepare for teaching classes at NMSU.

## Mathematical Sciences

### Undergraduate Program Information

In addition to meeting University and College requirements, students earning a Bachelor of Science in Mathematics must fulfill the core departmental requirements and choose from one of three emphases:

- General,
- Applied Mathematics or
- Actuarial Science and Insurance.

Students must earn a grade of C- or better in all departmental and nondepartmental courses for any degree in the Department of Mathematical Sciences.

## Graduate Program Information

The Department of Mathematical Sciences offers graduate instruction leading to the Master of Science degree, and Doctor of Philosophy degree. Possible areas of study are various topics in pure mathematics and applied mathematics, statistics and mathematics education. Students may also pursue an interdisciplinary program of study. Most graduate students in Mathematical Sciences are supported either through teaching assistantships, research assistantships, fellowships, or job opportunities at nearby teaching or research units.

For more information on our programs and facilities, and to learn more about the research interests of the faculty, please see our web site at [www.math.nmsu.edu](http://www.math.nmsu.edu) (<https://www.math.nmsu.edu>), phone us at (575) 646-3901, or write to:

Graduate Secretary  
Department of Mathematical Sciences  
NMSU  
Las Cruces, NM 88003-8001  
Email: [gradcomm@nmsu.edu](mailto:gradcomm@nmsu.edu)

Students applying for regular admission to graduate study in mathematics are expected to have 24 credits of upper-division courses in mathematics and statistics, including three-credit proof based courses in modern analysis and in modern algebra. Students who do not meet these requirements may be admitted with deficiencies and allowed to complete the requirements at New Mexico State University.

Applications must be submitted online, see <http://prospective.nmsu.edu/graduate/apply/>. The minimum application to be admitted as a regular graduate student in mathematics includes:

1. a completed Graduate School admission application
2. complete transcripts of all undergraduate and graduate work
3. application fee
4. three letters of recommendation from professors, employers, or others who are qualified to judge potential for graduate work in mathematics
5. a one-page statement of educational objectives

Although GRE subject test scores are not required for admission, applicants are encouraged to submit them, if available. The test scores may be used to help allocate available teaching assistantships among entering students.

To ensure full consideration for admission, candidates should submit their applications by the following deadlines.

## Application Deadlines-Domestic Applicants

Semester	Admission Only	Admission/Financial Aid
Fall	July 1	February 1
Spring/Summer	October 1	October 1

## Application Deadlines-International Applicants

Semester	Admission Only	Admission/Financial Aid
Fall	February 1	February 1
Spring/Summer	October 1	October 1

## Degrees for the Department

Mathematics - Bachelor of Science (p. 371)

Applied Mathematics - Supplemental Major (p. 373)

Mathematics - Master of Science (p. 375)

Mathematics - Doctor of Philosophy (p. 375)

## Minors for the Department

Mathematics - Undergraduate Minor (p. 374)

### Professor, Joseph Lakey, Department Head

**Professors** Baggett, Barany, Bezhanishvili, DeBlassie, Giorgi, Harding, Lakey, Lodder, Morandi, Olberding, Smits, Wang; **Associate Professors** Ballyk, Fouli, Salamanca-Riba, Stanford, Tian; **Assistant Professors** Cahill, Chen, Contreras, Montañó; **College Professors** Fulte, Mostafa, Stuart, Zimmerman; **College Associate Professors** White-Hosford; **College Assistant Professors** Ausbrooks, Villaverde; **College Instructors** Reece

*J. Lakey, Department Head, Ph.D. (Maryland) – applied harmonic analysis; P. Baggett, Ph.D. (Colorado) – mathematics education; M. Ballyk, Ph.D. (McMaster) – mathematical biology and ecology; E. Barany, Ph.D. (Ohio State) – mathematical physics; G. Bezhanishvili, Ph.D. (Tokyo Institute of Technology) – topology, algebra, and categories in logic; J. Cahill, Ph.D. (Missouri) – applied harmonic analysis; X. Chen, Ph.D. (Vanderbilt) – applied and computational harmonic analysis; A. Contreras, Ph.D. (Indiana) – analysis and applied mathematics; R. DeBlassie, Ph.D. (MIT) – probability; L. Fouli, Ph.D. (Purdue) – commutative algebra; T. Giorgi, Ph.D. (Purdue) – applied mathematics; J. Harding, Ph.D. (McMaster) – applications of topological methods to ordered structures; G. Lodder, Ph.D. (Stanford) – topology, geometry, history of mathematics; J. Montañó, Ph.D. (Purdue) – commutative algebra; P. Morandi, Ph.D. (California-San Diego) – universal algebra, division algebras; B. Olberding, Ph.D. (Wesleyan) – commutative algebra, valuation theory and module theory; S. Salamanca-Riba, Ph.D. (M.I.T.) – representation theory of Lie groups; R. Smits, Ph.D. (Purdue) – probability, harmonic analysis; T. Stanford, Ph.D. (Columbia) – math education; J. Tian, Ph.D. (California-Riverside) – applied mathematics, mathematical biology, and biostatistics; T. Wang, Ph.D. (Windsor) – mathematical statistics. Associated Faculty: Annie Selden, Ph.D. (Clarkson) – mathematics education; John Selden, Ph.D. (Georgia) – mathematics education.*

## Mathematics Courses

### MATH 101. General Supplemental Instruction I

#### 1 Credit

Collaborative workshop for students enrolled in Intermediate Algebra. S/U Grading (S/U, Audit).

**Corequisite(s):** MATH 120.

### MATH 102. General Supplemental Instruction II

#### 1 Credit

Collaborative workshop for students enrolled in College Algebra. S/U Grading (S/U, Audit).

**Corequisite(s):** MATH 121G.

**MATH 107. Topics in Mathematics****1-3 Credits**

Topics to be announced in the Schedule of Classes. Maximum of 3 credits per semester. Total credit not to exceed 6 credits. Community Colleges only.

**Prerequisite:** consent of instructor.

**MATH 111. Fundamentals of Elementary Mathematics I****3 Credits**

Numbers and the four operations of arithmetic. Understanding and comparing multiple representations of numbers and operations, in particular how these representations build from whole numbers to integers to fractions and decimals. Applying properties of numbers and operations in contextual situations. Reasoning, communicating, and problem solving with numbers and operations. Applications to ratio, and connections with algebra. Taught primarily through student activities and investigations. Restricted to: EDUC,EPAR,E ED,ECED majors.

**Prerequisite(s):** ENGL 111G and grade of C or better in MATH 120.

**MATH 112G. Fundamentals of Elementary Math II****3 Credits**

Geometry and measurement. Multiple approaches to solving problems and understanding concepts in geometry. Analyzing and constructing two- and three-dimensional shapes. Measurable attributes, including angle, length, area, and volume. Understanding and applying units and unit conversions. Transformations, congruence, and symmetry. Scale factor and similarity. Coordinate geometry and connections with algebra. Reasoning and communicating about geometric concepts. Taught primarily through student activities and investigations.

**Prerequisite(s):** C or better in MATH 111.

**MATH 120. Intermediate Algebra****3 Credits**

Linear and algebraic functions as they arise in real world problems. Exponential and logarithmic functions. Equations and inequalities and their solutions considered symbolically, graphically and numerically.

**Prerequisite:** adequate score on the Mathematics Placement Examination.

**MATH 121G. College Algebra****3 Credits**

Fundamental concepts of functions, including algebraic and graphical properties. Fitting functions to data. Finding zeroes and extreme values. Solving systems of equations.

**Prerequisites:** Adequate math placement score or C or better in MATH 120.

**MATH 142G. Calculus for the Biological and Management Sciences****3 Credits (2+2P)**

Review of functions. Derivatives, exponential and logarithmic functions, antiderivatives and indefinite integrals, basic ordinary differential equations and growth models, with an emphasis on applications.

Includes a significant writing component.

**Prerequisite(s):** C or better in MATH 121G.

**MATH 190G. Trigonometry and Precalculus****4 Credits (3+2P)**

Elementary functions used in the sciences with emphasis on trigonometric functions and their inverses. Polar coordinates. Complex numbers and Euler's formula. Analytic geometry and vectors.

**Prerequisite:** adequate score on Mathematics placement exam or a C or better in MATH 121G.

**MATH 191G. Calculus and Analytic Geometry I****4 Credits**

Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule.

**Prerequisite(s):** C or better in MATH 190G.

**MATH 192G. Calculus and Analytic Geometry II****4 Credits**

Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series.

**Prerequisite(s):** C or better in MATH 191G.

**MATH 192GH. Calculus and Analytic Geometry II Honors****4 Credits (3+1P)**

A more advanced treatment of the material of MATH 192G with additional topics. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of Department.

**MATH 200. Directed Study****1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of the instructor.

**MATH 210G. Mathematics Appreciation****3 Credits**

Mathematics and its role in the development and maintenance of civilization.

**Prerequisites:** High school algebra, and an adequate score on the Mathematics Placement Examination.

**MATH 215. Fundamentals of Elementary Mathematics III****3 Credits**

Probability, statistics, ratios, and proportional relationships. Experimental and theoretical probability. Collecting, analyzing, and displaying data, including measurement data. Multiple approaches to solving problems involving proportional relationships, with connections to number and operation, geometry and measurement, and algebra. Understanding data in professional contexts of teaching. Taught primarily through student activities and investigations.

**Prerequisite(s):** C or better in MATH 112.

**MATH 235. Calculus for the Technical Student I****3 Credits**

Intuitive differential and integral calculus with applications to engineering.

**Prerequisite:** C or better in MATH 190G.

**MATH 236. Calculus for the Technical Student II****3 Credits**

A continuation and extension of the material in MATH 235.

**Prerequisites:** C or better in MATH 235 or in MATH 192G.

**MATH 279. Introduction to Higher Mathematics****3 Credits**

Logic; sets, relations, and functions; introduction to mathematical proofs.

**Prerequisite(s):** C- or better in MATH 192.

**MATH 280. Introduction to Linear Algebra****3 Credits**

Systems of equations, matrices, vector spaces and linear transformations. Applications to computer science.

**Prerequisite(s):** Grade of C- or better in MATH 192G.

**MATH 291G. Calculus and Analytic Geometry III****3 Credits**

Vector algebra, directional derivatives, approximation, max-min problems, multiple integrals, applications, cylindrical and spherical coordinates, change of variables.

**Prerequisite:** grade of C or better in MATH 192G.

**MATH 300. Readings****1-3 Credits**

A selection of readings and reports in the mathematical sciences, the breadth and depth of which is deemed to fit the needs of the student. Graded S/U.

**Prerequisite:** consent of instructor.

**MATH 313. Fundamentals of Algebra and Geometry I****3 Credits (3+1P)**

Covers algebra combined with geometry based on measurements of distance (metric geometry). Secondary mathematics education majors may take course as a math elective. MATH 313 does not substitute for other required math courses. Does not fulfill requirements for major in mathematics.

**Prerequisites:** MATH 111 and MATH 112G.

**MATH 316. Calculus with Hands-on Applications****3 Credits**

This course, primarily for prospective teachers, is taught in an interactive laboratory format. Students design and construct physical objects for which the planning stage requires calculus techniques. All numerical computations are carried out on graphing calculators. Meets simultaneously with MATH 516, primarily for practicing teachers. Secondary math education majors may take course as a math elective. MATH 316 does not fulfill requirements for majors in mathematics. Consent of instructor required.

**MATH 331. Introduction to Modern Algebra****3 Credits**

Elements of abstract algebra, including groups, rings and fields.

**Prerequisite:** C or better in MATH 279 and MATH 280.

**MATH 332. Introduction to Analysis****3 Credits**

Development of the real numbers, a rigorous treatment of sequences, limits, continuity, differentiation, and integration.

**Prerequisite:** C or better in MATH 192G and MATH 279.

**MATH 377. Introduction to Numerical Methods****3 Credits**

Basic numerical methods for interpolation, approximation, locating zeros of functions, integration, and solution of linear equations. Computer-oriented methods will be emphasized.

**Prerequisites:** grade of C or better in MATH 192G and some programming experience.

**MATH 391. Vector Analysis****3 Credits**

Calculus of vector valued functions, Green's and Stokes' theorems and applications.

**Prerequisite:** grade of C or better in MATH 291G.

**MATH 392. Introduction to Ordinary Differential Equations****3 Credits**

Introduction to differential equations and dynamical systems with emphasis on modeling and applications. Basic analytic, qualitative and numerical methods. Equilibria and bifurcations. Linear systems with matrix methods, real and complex solutions.

**Prerequisite:** C or better in MATH 192G or B or better in MATH 236.

**MATH 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of faculty member.

**MATH 401. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be used to fulfill a course requirement for the mathematics major. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**MATH 411V. Great Theorems: The Art of Mathematics****3 Credits**

Adopts the view of mathematics as art, using original sources displaying the creation of mathematical masterpieces from antiquity to the modern era. Original sources are supplemented by cultural, biographical, and mathematical history placing mathematics in a broad human context.

**Prerequisites:** Grades of B or better in MATH 192G and any upper division MATH/STAT course, with overall GPA of 3.2 or better, or consent of instructor.

**MATH 421. Financial Mathematics I****3 Credits**

Types of derivatives, forwards and futures, options, returns and payoffs, Arrow-Debre, complete and incomplete markets, the one period model, the binomial option pricing model, binomial trees, martingales and sub martingales, Brownian motion, stochastic integrals, the Ito integral, Ito's dilemma, the Black-Scholes model, the Black-Scholes formula, European options, American options, free boundary problems, variational inequalities. This course is offered simultaneously with MATH 521.

**Prerequisite(s):** C or better in STAT 371 and either MATH 280 or MATH 480 or consent of instructor.

**MATH 422. Financial Mathematics II****3 Credits**

Bonds, swaps, exotic options, barrier options, Asian options, look back options, options with transaction costs, Fokker Plank theory, computing expectations, the Heath-Jarrow- Morton theorem, the Ho-Lee model, stochastic volatility models, exponential-affine models, numerical methods. This course is offered simultaneously with MATH 522.

**Prerequisite:** C or better in MATH 421 or consent of instructor

**MATH 423. Numerical Optimization and Applications to Financial Mathematics****3 Credits**

Dynamic optimization of a monopolist, trading off inflation and unemployment, the optimal adjustment of labor demand, infinite planning horizon, the optimal investment path of a firm, the optimal social saving behavior, phase-diagram analysis, optimal control theory, the political business cycle, the dynamics of a revenue-maximizing firm, economic examples of state-space constraints. This course is offered simultaneously with MATH 523.

**Prerequisite(s):** C- or better in MATH 421.

**MATH 451. Introduction to Differential Geometry****3 Credits**

Applies calculus to curves and surfaces in three dimensional Euclidean space.

**Prerequisite(s):** C- or better in each of MATH 280 and MATH 391, or consent of instructor.

**MATH 452. Foundations of Geometry****3 Credits**

Topics in projective, axiomatic Euclidean or non-Euclidean geometries.

Restricted to: Main campus only.

**Prerequisite(s):** C or better in MATH 331 or MATH 332.

**MATH 453. Introduction to Topology****3 Credits**

Introduction to topological spaces and metric spaces, with connections to analysis, geometry, and the classification of surfaces.

**Prerequisite(s):** C- or better in MATH 332 or consent of instructor.

**MATH 454. Mathematical Logic****3 Credits**

Propositional calculus and the first order predicate calculus, including Godel's completeness theorem for the latter, and additional topics at the option of the instructor.

**Prerequisite(s):** C or better in MATH 331 or MATH 332, or consent of instructor.

**MATH 455. Elementary Number Theory****3 Credits**

Covers primes, congruences and related topics.

**Prerequisite:** grade of C or better in MATH 331 or consent of instructor.

**MATH 457. Applications of Modern Algebra****3 Credits**

Topics may include coding theory, cryptography, graph theory, or symmetry groups. May be repeated up to 9 credits.

**Prerequisite(s):** C or better in MATH 331 or consent of instructor.

**MATH 459. Survey of Geometry****3 Credits**

Basic concepts of Euclidean geometry, ruler and compass constructions.

May include topics in non-Euclidean geometry. For non-math majors.

Restricted to: Main campus only.

**Prerequisite(s):** C or better in MATH 331 or MATH 332.

**MATH 466. Lattice Theory****3 Credits**

Introduction to partially ordered sets, distributive, modular, and Boolean lattices.

**Prerequisite(s):** C- or better in MATH 330 or C- or better in MATH 331 or C- or better in MATH 332 or consent of instructor.

**MATH 471. Complex Variables****3 Credits**

A first course in complex function theory, with emphasis on applications.

**Prerequisite(s):** C- or better in MATH 391 or C- or better in both MATH 392 and MATH 291.

**MATH 472. Fourier Series and Boundary Value Problems****3 Credits**

Fourier series and methods of solution of the boundary value problems of applied mathematics.

**Prerequisite(s):** C- or better in MATH 392.

**MATH 473. Calculus of Variations and Optimal Control****3 Credits**

Euler's equations, conditions for extrema, direct methods, dynamic programming, and the Pontryagin maximal principle.

**Prerequisite(s):** C- or better in MATH 392.

**MATH 480. Matrix Theory and Applied Linear Algebra****3 Credits**

An application driven course, whose topics include rectangular systems, matrix algebra, vector spaces and linear transformations, inner products, and eigenvalues and eigenvectors. Applications may include LU factorization, least squares, data compression, QR factorization, singular value decomposition, and search engines.

**Prerequisite(s):** C or better in any 300-level course with a MATH or STAT prefix.

**MATH 481. Advanced Linear Algebra****3 Credits**

Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics.

**Prerequisite:** grade of C or better in MATH 331.

**MATH 491. Introduction to Real Analysis I****3 Credits**

Rigorous discussion of the topics introduced in calculus. Sequences, series, limits, continuity, differentiation.

**Prerequisite:** grade of C or better in MATH 332 or consent of instructor.

**MATH 492. Introduction to Real Analysis II****3 Credits**

Continuation of MATH 491. Integration, metric spaces and selected topics.

**Prerequisite(s):** C- or better in MATH 491 or consent of instructor.

**MATH 498. Directed Reading****1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**MATH 501. Introduction to Differential Geometry****3 Credits**

Same as MATH 451 with additional work for graduate students.

**MATH 502. Foundations of Geometry****3 Credits**

Same as MATH 452 with additional assignments for graduate students.

**MATH 503. Introduction to Topology****3 Credits**

Same as MATH 453 with additional work for graduate students.

**MATH 504. Mathematical Logic****3 Credits**

Same as MATH 454 with additional assignments for graduate students.

**MATH 505. Elementary Number Theory****3 Credits**

Same as MATH 455 with additional assignments for graduate students.

**MATH 506. Lattice Theory****3 Credits**

Same as MATH 466 with additional assignments for graduate students.

**MATH 507. Applications of Modern Algebra****3 Credits**

Taught with MATH 457 with additional work for graduate students. May be repeated up to 9 credits.

**MATH 509. Information Theory****3 Credits**

This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression.

Restricted to: Main campus only. Crosslisted with: E E 586

**Prerequisite(s):** E E 571 or STAT 515.

**MATH 511. Fundamentals of Elementary Mathematics I****3 Credits (3+1P)**

Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 111 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

**MATH 512. Fundamentals of Elementary Mathematics II****3 Credits (3+1P)**

Real numbers, geometry, and statistics, incorporating calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 112 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

**MATH 513. Fundamentals of Algebra and Geometry I****3 Credits (3+1P)**

Algebra and metric geometry, incorporating appropriate calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 313 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

**MATH 516. Calculus with Hands-on Application****3 Credits**

This course, primarily for in-service teachers, is taught in an interactive laboratory format. Students design and construct physical objects for which the planning stage requires calculus techniques. All numerical computations are carried out on graphing calculators. Meets simultaneously with Math 316, primarily for prospective teachers. Does not fulfill degree requirements for M.S. in Mathematics.

**Prerequisite(s):** MATH 511 and MATH 512 or consent of instructor.

**MATH 517. Complex Variables****3 Credits**

Same as MATH 471 with additional work for graduate students.

**MATH 518. Fourier Series and Boundary Value Problems****3 Credits**

Same as MATH 472 with additional work for graduate students.

**MATH 519. Calculus of Variations and Optimal Control****3 Credits**

Same as MATH 473 with additional work for graduate students.

**MATH 521. Financial Mathematics I: Portfolio Optimization****3 Credits**

Complete and incomplete markets, optimal investment paths, dynamic optimization, the Black-Scholes model, European options, American options. May be repeated up to 3 credits.

**Prerequisite(s):** STAT 515.

**MATH 522. Financial Mathematics II****3 Credits**

Bonds, Swaps, Exotic options, Barrier options, Asian options, Lookback options, options with transaction costs, Fokker Plank theory: computing expectations, The Heath-Jarrow-Morton theorem, the Ho-Lee model, Stochastic volatility models, Exponential-Affine models, numerical methods.

**Prerequisite:** MATH 521.

**MATH 523. Numerical Optimization and Applications to Financial Mathematics****3 Credits**

Dynamic optimization of a monopolist, trading off inflation and unemployment, the optimal adjustment of labor demand, infinite planning horizon, the optimal investment path of a firm, the optimal social saving behavior, phase-diagram analysis, optimal control theory, the political business cycle, the dynamics of a revenue-maximizing firm, economic examples of state-space constraints. This course is offered simultaneously with MATH 423.

**Prerequisite:** MATH 521.

**MATH 525. Advanced Linear Algebra****3 Credits**

Same as MATH 481 with additional work for graduate students. May be repeated up to 3 credits.

**MATH 527. Introduction to Real Analysis I****3 Credits**

Same as MATH 491 with additional work for graduate students.

**MATH 528. Introduction to Real Analysis II****3 Credits**

Same as MATH 492 with additional work for graduate students.

**MATH 530. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.

**MATH 531. Ordinary Differential Equations****3 Credits**

Linear algebra and linear ordinary differential equations, existence and uniqueness of solution, smooth dependence on initial conditions, flows, introduction to smooth dynamical systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 527, or consent of instructor.

**MATH 532. Partial Differential Equations****3 Credits**

The basic equations of mathematical physics. Elliptic, hyperbolic, and parabolic equations. Characteristic surfaces. Well-posed problems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 527 or consent of instructor.

**MATH 540. Directed Reading****1-6 Credits**

May be repeated for a maximum of 6 credits. Consent of instructor required. Graded: S/U.

**MATH 541. Topology I****3 Credits**

Connectedness and compactness of topological spaces, introduction to the quotient topology, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem

**Prerequisite(s):** MATH 525 and MATH 528, or consent of instructor.

**MATH 542. Topology II****3 Credits**

Covering spaces and their classification, singular homology, degree theory, Brouwer's fixed point theorem, CW-complexes and cellular homology, and other applications.

**Prerequisite(s):** MATH 541 or consent of instructor.

**MATH 555. Differentiable Manifolds****3 Credits**

Differentiable structures, tangent bundles, vector fields and differential equations. Additional topics may include differential forms, De Rham cohomology, Riemannian geometry, and topics chosen by the instructor. May be repeated for a maximum of 9 credits. Consent of instructor required.

**Prerequisite(s):** MATH 525 and MATH 528, or consent of instructor.

**MATH 557. Axiomatic Set Theory****3 Credits**

A detailed study of Zermelo-Fraenkel and Bernays set theories.

**Prerequisite:** MATH 504 or equivalent.

**MATH 562. History and Theories of Mathematics Education****3 Credits**

A study of the history of the mathematics taught in American schools, including an examination of authentic original textbooks and the changes in their content and the approach to the subject over time, together with writings of people who have influenced the development and changes of mathematics education. Theories of learning mathematics, and current issues in mathematics education.

**Prerequisite(s):** Restricted to graduate students.

**MATH 563. Algebra with Connections****3 Credits**

Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 564. From Number to Algebra****3 Credits**

The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 566. Data Analysis with Applications****3 Credits**

Statistical concepts and terminology in professional uses of data by teachers, such as standardized test score reports and educational research; visual displays of data; measures of variation and central tendency; consideration of how K-12 topics in Data Analysis are developed from one grade level to the next. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 567. From Measurement to Geometry****3 Credits**

The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to-abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 568. Using Number Throughout the Curriculum****3 Credits**

Understand number concepts more deeply by seeing many examples of those concepts applied in other content strands. Develop mathematical knowledge and understanding to build a repertoire of ways for students to practice and review basic number skills and concepts as part of later, more advanced courses. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 569. Geometry with Connections****3 Credits**

Connections between Geometry and other K-12 curriculum strands, especially Algebra and Probability / Data Analysis. Address key attributes of geometric concepts by considering their connections within and across grade levels. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 581. Algebra I****3 Credits**

Examines groups, commutative rings, solvability of polynomials, Galois theory, ruler and compass constructions.

**Prerequisite/corequisite:** MATH 525.

**MATH 582. Algebra II****3 Credits**

Group actions, fundamental theorem of finite Abelian groups, Sylow theorems, solvable groups, noncommutative rings, Noetherian rings, unique factorization domains, modules, tensor products.

**Prerequisite:** MATH 581.

**MATH 583. Introduction to Commutative Algebra and Algebraic Geometry****3 Credits**

Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases. May be repeated up to 9 credits.

**Prerequisite(s):** MATH 581 or consent of instructor.

**MATH 584. Representation Theory****3 Credits**

Topics from representation theory of finite or infinite groups. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**MATH 585. Universal Algebra****3 Credits**

Universal algebra and category theory. Theorems of Birkhoff and Tarski relating equational classes, free algebras and their construction through homomorphisms, subalgebras and products. Topics from model theory, sheaf theory and representation by subdirect products. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**MATH 586. Nonlinear Dynamics I****3 Credits**

Introduction to nonlinear dynamics and deterministic chaos. Core topics include stability and bifurcations; chaos in one dimensional maps; universality and re-normalization group. Further topics include symbolic dynamics, fractals, sensitive dependence on initial data, self-organization and complexity and cellular automata. Knowledge of differential equations and linear algebra is desired. May be repeated up to 6 credits.

**MATH 591. Complex Analysis I****3 Credits**

Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 528, or consent of instructor.

**MATH 593. Measure and Integration****3 Credits**

Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.

**Prerequisite:** MATH 528 or consent of instructor.

**MATH 594. Real Analysis****3 Credits**

Differentiation,  $L_p$  spaces, Banach spaces, measure and topology, other selected topics.

**Prerequisite:** MATH 593.

**MATH 599. Master's Thesis****15 Credits**

Thesis.

**MATH 600. Doctoral Research****1-15 Credits**

Research.

**MATH 643. Topology III****3 Credits**

Topics may include higher homotopy groups, fibrations, cohomology operations and obstruction theory, spectral sequences, or others chosen by instructor. May be repeated for a maximum of 9 credits.

**Prerequisites:** MATH 542 or consent of instructor.

**MATH 683. Homological Algebra****3 Credits**

Basic topics in homological algebra and category theory. May be repeated for a maximum of 9 credits.

**Prerequisite:** MATH 542 or MATH 582 or consent of instructor.

**MATH 695. Introduction to Functional Analysis I****3 Credits**

Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 594, or consent of instructor.

**MATH 698. Selected Topics****1-15 Credits**

Selected topics.

**MATH 700. Doctoral Dissertation****1-15 Credits**

Dissertation.

## Statistics Courses

**STAT 251G. Statistics for Business and the Behavioral Sciences****3 Credits**

Techniques for describing and analyzing data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. Crosslisted with: A ST 251G.

**Prerequisite(s):** C- or better in MATH 120.

**STAT 271G. Statistics for Psychological Sciences****3 Credits**

Techniques for describing and analyzing data; basic concepts of statistical inference; estimation, hypothesis testing, correlation, and analysis of variance.

**Prerequisite(s):** C- or better in MATH 120.

**STAT 371. Statistics for Engineers and Scientists I****3 Credits**

Modern probability and statistics with applications to the engineering sciences.

**Prerequisite(s):** C- or better in MATH 192.

**STAT 400. Undergraduate Research****1-3 Credits**

Arrangements must be made with supervising professor before registration. May be repeated for a maximum of 6 credits.

**STAT 470. Probability: Theory and Applications****3 Credits**

Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.

**Prerequisite(s):** C- or better in MATH 291 and C- or better in at least one-300 level Math course.

**STAT 480. Statistics: Theory and Applications****3 Credits**

Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.

**Prerequisite(s):** C- or better in STAT 470.

**STAT 515. Probability: Theory and Applications****3 Credits**

Same as STAT 470 with additional work for graduate students.

**STAT 525. Statistics: Theory and Applications****3 Credits**

Same as STAT 480 with additional work for graduate students.

**STAT 535. Elementary Stochastic Processes****3 Credits**

Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.

**Prerequisite:** STAT 515 or consent of instructor.

**STAT 540. Directed Reading****1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor and graduate committee.

**STAT 562. Foundations of Probability****3 Credits**

Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.

**Prerequisite:** MATH 593.

**STAT 571. Continuous Multivariate Analysis****3 Credits**

Theory and applications of the multivariate normal distribution. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** STAT 525, or consent of instructor.

**STAT 572. Linear Models****3 Credits**

Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.

**Prerequisite(s):** STAT 571.

**STAT 581. Advanced Theory of Statistics I****3 Credits**

Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.

**Prerequisite:** STAT 525 or consent of instructor.

**STAT 582. Advanced Theory of Statistics II****3 Credits**

Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.

**Prerequisite:** STAT 581 or consent of instructor.

**STAT 598. Special Research Problems****1-3 Credits**

Individual investigations or consulting programs. Maximum of 3 credits.

**Phone:** (575) 646-3901

**Website:** <http://math.nmsu.edu/>

## Mathematics - Bachelor of Science

**Core Departmental Requirements**

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 279	Introduction to Higher Mathematics	3
MATH 280	Introduction to Linear Algebra	3
Total Credits		17

### Notes

Some students may be able to bypass one or more courses in the calculus sequence MATH 191-192-291. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

Students planning to enter a graduate program in Mathematics should select the General Emphasis. In any case, such students are strongly advised to take both MATH 331 Introduction to Modern Algebra and MATH 332 Introduction to Analysis, since these courses are required by most programs, and should take as many as possible of the following courses

MATH 481	Advanced Linear Algebra	3
MATH 491	Introduction to Real Analysis I	3
MATH 492	Introduction to Real Analysis II	3

Students planning to do graduate work in Mathematics are encouraged to take French or German to meet the requirement of a second language.

## Concentration: Actuarial Science and Insurance

The concentration in Actuarial Science and Insurance draws on courses from mathematics and business to prepare students for a mathematical career in insurance. The coursework in this emphasis focuses on the analysis of risk and its applications to insurance finance. Students fulfilling the requirements for the Actuarial Science and Insurance Concentration earn a minor in Risk Management and Insurance.

**Departmental Requirements**

MATH 331	Introduction to Modern Algebra	3
or MATH 332	Introduction to Analysis	
STAT 371	Statistics for Engineers and Scientists I	3
STAT 470	Probability: Theory and Applications	3
STAT 480	Statistics: Theory and Applications	3

**Departmental Electives**

Select at least an additional 9 credits of approved upper-division courses prefixed MATH or STAT, excluding the following:<sup>1</sup>

MATH 300	Readings	
MATH 313	Fundamentals of Algebra and Geometry I	
MATH 316	Calculus with Hands-on Applications	
MATH 400	Undergraduate Research	
MATH 459	Survey of Geometry	
STAT 400	Undergraduate Research	

**Nondepartmental Requirements**

ACCT 221	Principles of Accounting I (Financial)	3
ACCT 222	Principles of Accounting II (Managerial)	3
BLAW 316	Legal Environment of Business	3
or BLAW 385V	Consumers and the Law	
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
FIN 322	Principles of Insurance	3
FIN 341	Financial Analysis and Markets	3
Select one from the following:		3
FIN 326	Business Risk Management	
FIN 323	Life/Health/Employee Benefits	
FIN 324	Property and Liability Insurance	

**Insurance Electives**

Select 6 credits from the following:		6
FIN 303V	Personal Financial Planning and Investing in a Global Economy	
or FIN 421	Personal Financial Planning for Professionals	
FIN 323	Life/Health/Employee Benefits	
FIN 324	Property and Liability Insurance	
FIN 391	Finance Internship and Cooperative Education I	

**Second Language Requirement: (not required)**

Total Credits		51
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<sup>1</sup> MATH 401 Special Topics must be approved by the department for credit towards the major. At least 6 of the MATH and STAT credit hours must be numbered higher than 400.

## Second Language Requirement

For the Bachelor of Science with a major in Mathematics with a Concentration in Actuarial Science and Insurance, there is no second language requirement for the degree.

## Concentration: Applied Mathematics

The Applied Mathematics concentration is intended to prepare students planning a mathematically oriented career upon graduation. The coursework in this concentration provides a foundation in mathematics important in many scientific and engineering applications.

### Departmental Requirements

MATH 377	Introduction to Numerical Methods	3
MATH 392	Introduction to Ordinary Differential Equations	3
MATH 471	Complex Variables	3
MATH 472	Fourier Series and Boundary Value Problems	3
STAT 371	Statistics for Engineers and Scientists I	3
STAT 470	Probability: Theory and Applications	3

### Departmental Electives

Select at least 6 credits of approved additional upper-division courses prefixed MATH or STAT, excluding the following:<sup>2</sup> 6

MATH 300	Readings
MATH 313	Fundamentals of Algebra and Geometry I
MATH 400	Undergraduate Research
MATH 459	Survey of Geometry
STAT 400	Undergraduate Research

### Nondepartmental Requirements

Select a minimum of 12 credit hours of electives to form a coherent cluster in an applied area from the following:<sup>3</sup> 12

Examples of acceptable clusters:

#### Signals

Select 9 credits from the following:

E E 112	Embedded Systems
E E 230	AC Circuit Analysis and Introduction to Power Systems
E E 320	Signals and Systems I
E E 395	Introduction to Digital Signal Processing
E E 496	Introduction to Communication Systems

#### Structures

C S 172	Computer Science I
or E E 112	Embedded Systems
Select 9 credits from the following:	
PHYS 215G	Engineering Physics I
C E 233	Mechanics-Statics
C E 301	Mechanics of Materials
C E 315	Structural Analysis

#### Operations Research

Select three from the following:

I E 311	Engineering Data Analysis
I E 365	Quality Control
I E 413	Engineering Operations Research I
I E 423	Engineering Operations Research II

I E 460	Evaluation of Engineering Data
<i>Algorithm Theory</i>	
C S 172	Computer Science I
C S 272	Introduction to Data Structures
C S 370	Compilers and Automata Theory
C S 372	Data Structures and Algorithms
<i>Bioinformatics</i>	
BIOL 211G	Cellular and Organismal Biology
BIOL 211GL	Cellular and Organismal Biology Laboratory
C S 486	Bioinformatics
Select 6 credits from the following:	
C S 172	Computer Science I
C S 272	Introduction to Data Structures
C S 370	Compilers and Automata Theory
C S 371	Software Development
C S 372	Data Structures and Algorithms
<i>Computer Systems</i>	
C S 172	Computer Science I
Select 9 credits from the following:	
C S 271	Object Oriented Programming
or C S 272	Introduction to Data Structures
C S 371	Software Development
Select 6-7 credits from the following:	
C S 370	Compilers and Automata Theory
C S 474	Operating Systems I
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 482	Database Management Systems I
C S 484	Computer Networks I
C S 485	User Interface Design
<b>Second Language Requirement: (not required)</b>	

Total Credits 36

<sup>2</sup> MATH 401 Special Topics must be approved by the department for credit towards the major. At least 6 of the MATH and STAT credit hours must be numbered higher than 400.

<sup>3</sup> Students may propose clusters subject to departmental approval. A cluster must contain either C S 172 Computer Science I or E E 112 Embedded Systems. A major or minor in any of the following fields (along with C S 172 Computer Science I or E E 112 Embedded Systems) will also fulfill the Cluster Electives requirement: Computer Science, Physics, Biology, Chemistry and Biochemistry, Chemical Engineering, Engineering Physics, Electrical and Computer Engineering, Industrial Engineering, Mechanical Engineering, Civil Engineering, Economics and Finance.

## Second Language Requirement

For the Bachelor of Science with a major in Mathematics with a Concentration in Applied Mathematics, there is no second language requirement for the degree.

## Concentrations: General Mathematics

Students seeking a foundation in pure mathematics and flexibility in the curriculum are encouraged to pursue the General Mathematics

Concentration. Students choosing this emphasis should work closely with a faculty advisor to select courses appropriate to their interests.

### Departmental Requirements

MATH 331	Introduction to Modern Algebra	3
MATH 332	Introduction to Analysis	3

### Departmental Electives

Select at least 18 additional upper-division credits of approved courses prefixed MATH or STAT, excluding: <sup>4</sup>

MATH 300	Readings	
MATH 313	Fundamentals of Algebra and Geometry I	
MATH 316	Calculus with Hands-on Applications	
MATH 400	Undergraduate Research	
MATH 459	Survey of Geometry	
STAT 400	Undergraduate Research	

### Nondepartmental Requirements for the Major <sup>5</sup>

C S 172	Computer Science I	4
C S 272	Introduction to Data Structures	4

### Second Language Requirement: (required- see below)

Total Credits 32

<sup>4</sup> MATH 401 Special Topics must be approved by the department for credit towards the major. At least 12 of the MATH and STAT credits must be numbered higher than 400.

<sup>5</sup> A grade of C- or better must be earned.

*Note: It is strongly recommended that mathematics majors in the General Mathematics Concentration consider a minor or second major in an area that uses mathematics, such as physics or computer science. All programs should be planned with the guidance of a departmental advisor. More information is available at [www.math.nmsu.edu](http://www.math.nmsu.edu). (<https://www.math.nmsu.edu>)*

## Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in General Mathematics there is a two year second language requirement, the student must do one of the following:

### Option 1:

Complete one of the following sequences:

CHIN 111 & CHIN 112 & CHIN 211 & CHIN 212	Elementary Chinese I and Elementary Chinese II and Intermediate Chinese I and Intermediate Chinese II	14
FREN 111 & FREN 112 & FREN 211 & FREN 212	Elementary French I and Elementary French II and Intermediate French I and Intermediate French II	14
GER 111 & GER 112 & GER 211 & GER 212	Elementary German I and Elementary German II and Intermediate German I and Intermediate German II	14
JPNS 111 & JPNS 112 & JPNS 211 & JPNS 212	Elementary Japanese I and Elementary Japanese II and Intermediate Japanese I and Intermediate Japanese II	14

SPAN 111 & SPAN 112 & SPAN 211 & SPAN 212	Elementary Spanish I and Elementary Spanish II and Intermediate Spanish I and Intermediate Spanish II	14
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PORT 213 & PORT 214	Portuguese for Romance Language Students I and Portuguese for Romance Language Students II	6
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### For Heritage Speakers:

SPAN 113 & SPAN 213 & SPAN 214	Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	9
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### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3
C D 476	American Sign Language III	3

### Option 3:

Challenge the 212 level for the following courses:

CHIN 212 or FREN 212 or GER 212 or JPNS 212 or SPAN 212	Intermediate Chinese II Intermediate French II Intermediate German II Intermediate Japanese II Intermediate Spanish II	3
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OR

Challenge the 214 level for the following courses:

PORT 214 or SPAN 214	Portuguese for Romance Language Students II Spanish for Heritage Learners III	3
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### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Applied Mathematics - Supplemental Major

The program consists of 24 credits in the designated list of courses. To earn a supplementary major in applied mathematics a student must earn 15 credits from Categories I.A and I.B of which at least 9 credits must be from Category I.B. A student must also earn 9 credits from the Category II list of related disciplines. The courses in Category II may be taken from any combination of areas. A student may not earn a bachelor's degree in mathematics and also a supplementary major in applied mathematics.

### Requirements

#### Category I.A.

Select two from the following: 6

MATH 377	Introduction to Numerical Methods
MATH 391	Vector Analysis
MATH 392	Introduction to Ordinary Differential Equations
MATH 421	Financial Mathematics I
STAT 371	Statistics for Engineers and Scientists I

#### Category I.B.

Select three from the following: 9

MATH 331	Introduction to Modern Algebra
MATH 332	Introduction to Analysis
MATH 422	Financial Mathematics II
or MATH 423	Numerical Optimization and Applications to Financial Mathematics
MATH 451	Introduction to Differential Geometry
MATH 453	Introduction to Topology
MATH 454	Mathematical Logic
MATH 471	Complex Variables
MATH 472	Fourier Series and Boundary Value Problems
MATH 473	Calculus of Variations and Optimal Control
MATH 480	Matrix Theory and Applied Linear Algebra
STAT 470	Probability: Theory and Applications
STAT 480	Statistics: Theory and Applications

#### Category II

Select 9 credits from the following Related disciplines: 9

C E 315	Structural Analysis
C E 331	Fluid Mechanics and Hydraulics
C E 356	Fundamentals of Environmental Engineering
C E 382	Hydraulic and Hydrologic Engineering
C S 372	Data Structures and Algorithms
C S 476	Computer Graphics I
C S 486	Bioinformatics
C S 491	Parallel Programming
CHME 305	Transport Operations I: Fluid Flow
CHME 306	Transport Operations II: Heat and Mass Transfer
CHME 412	Process Dynamics and Control
CHME 441	Chemical Kinetics and Reactor Engineering
CHEM 433	Physical Chemistry I
CHEM 434	Physical Chemistry II
CHEM 456	Inorganic Structure and Bonding

ECON 405	Introductory Econometrics
ECON 457	Mathematical Economics
ECON 498	Independent Study (with approval)
E E 395	Introduction to Digital Signal Processing
E E 473	Introduction to Optics
E E 475	Automatic Control Systems
E E 476	Computer Control Systems
E E 496	Introduction to Communication Systems
E E 497	Digital Communication Systems I
FIN 355	Investments
FIN 385	Analysis of Financial Markets and Institutions
FIN 406	Theory of Financial Decisions
FIN 435	Investment Analysis
I E 365	Quality Control
I E 413	Engineering Operations Research I
I E 423	Engineering Operations Research II
I E 460	Evaluation of Engineering Data
I E 466	Reliability
M E 332	Vibrations
M E 333	Intermediate Dynamics
M E 338	Fluid Mechanics
M E 341	Heat Transfer
PHYS 395	Intermediate Mathematical Methods of Physics
PHYS 451	Intermediate Mechanics I
PHYS 454	Intermediate Modern Physics I
PHYS 455	Intermediate Modern Physics II
PHYS 461	Intermediate Electricity and Magnetism I
PHYS 462	Intermediate Electricity and Magnetism II
PHYS 473	Introduction to Optics
PHYS 476	Computational Physics
PHYS 480	Thermodynamics
PHYS 485	Independent Study
PHYS 495	Mathematical Methods of Physics I
SUR 351	Introductory Spatial Data Adjustment I
SUR 451	Advanced Survey Measurements, Analysis, and Adjustments
SUR 461	GNSS Positioning
C S 510	Automata, Languages, Computability <sup>1</sup>
C S 570	Analysis of Algorithms <sup>1</sup>

Total Credits 24

<sup>1</sup> Student must be eligible to take 500-level courses.

## Mathematics - Undergraduate Minor

A student must pass 18 or more credit hours in MATH and STAT courses, with at least 9 of the credits in upper division courses and three of those 9 credits in courses numbered above 400.

### Requirements

Select 18 credits or more in MATH and STAT courses, with at least 9 of the credits in upper division courses and three of those 9 credits in courses numbered above 400:<sup>1</sup> 18

The following courses are excluded from the minor:

Courses numbered below MATH 190		
MATH 200	Directed Study	
MATH 210G	Mathematics Appreciation	
MATH 300	Readings	
MATH 313	Fundamentals of Algebra and Geometry I	
MATH 316	Calculus with Hands-on Applications	
MATH 400	Undergraduate Research	
MATH 459	Survey of Geometry	
MATH 498	Directed Reading	
STAT 400	Undergraduate Research	
Select one from the following (at most):		3
STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
STAT 371	Statistics for Engineers and Scientists I	
Total Credits		18

<sup>1</sup> MATH 401 Special Topics must be approved by the department for credit toward the minor. Any course taught outside the Department of Mathematical Sciences but cross-listed with a MATH or STAT course, must also be approved by the department for credit toward the minor. A student may not earn a bachelor's degree in mathematics or a supplementary major in applied mathematics and also earn a minor in mathematics.

## Mathematics - Master of Science

The Master's degree is designed to increase one's knowledge and understanding of mathematics beyond the Bachelor's degree level. It also prepares a student for future graduate work.

A candidate for a master's degree may select up to two minors in addition to the major. A minimum of 8 credits of graduate work is necessary for a minor.

### Minimum Requirements for the Master's Degree

1. In fulfillment of the Graduate School requirement of a minimum of 30 semester credits of course work, the student must take at least 24 credits of mathematics or statistics from the courses listed below.
2. The student's program of study must be approved by the departmental Graduate Studies Committee.
3. The student must successfully complete a master's written examination and final master's oral examination.

#### Minimum Requirements

<i>Complete each of the following (12 credits):</i>		
MATH 525	Advanced Linear Algebra <sup>1</sup>	3
MATH 507	Applications of Modern Algebra	3
MATH 527	Introduction to Real Analysis I <sup>1</sup>	3
MATH 528	Introduction to Real Analysis II <sup>1</sup>	3
<i>Complete two of the following:</i>		6
MATH 503	Introduction to Topology	
MATH 504	Mathematical Logic	
MATH 591	Complex Analysis I	

STAT 515	Probability: Theory and Applications	
STAT 525	Statistics: Theory and Applications	
<i>Complete two of the following</i>		6
MATH 506	Lattice Theory	
MATH 531	Ordinary Differential Equations	
MATH 532	Partial Differential Equations	
MATH 541	Topology I	
MATH 542	Topology II	
MATH 581	Algebra I	
MATH 582	Algebra II	
MATH 583	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 585	Universal Algebra	
MATH 586	Nonlinear Dynamics I	
MATH 593	Measure and Integration	
MATH 594	Real Analysis	
STAT 562	Foundations of Probability	
STAT 571	Continuous Multivariate Analysis	
Total Credits		24

<sup>1</sup> The student must complete, transfer or challenge these courses.

## The Master's Written Examination

Candidates for the Master's in Mathematics must pass a written exam, offered each January and August, based on the content of MATH 525 and MATH 527. Full-time students need to pass the written Master's exam no later than the August following their completion of MATH 525 and MATH 527, or the start of their fourth semester in the program, whichever comes first. Graduate assistants must adhere to this timetable. Any second try must be passed within one semester of the first.

## The Master's Final Examination

The Master's final examination is an oral examination administered by the student's committee. The exam consists of a short presentation made by the student on a topic covered in the student's coursework, followed by an examination by the committee based on the presentation and related coursework in the student's program of study. When a Master's thesis has been written, the presentation and examination is based on the student's thesis. The student's committee consists of at least three departmental members and a Graduate faculty member from another department who serves as the Dean's representative. The oral exam must be completed at least 10 days prior to the end of the semester in which the candidate wishes to receive the degree.

## Mathematics - Doctor of Philosophy

Candidates for the Ph.D. degree in the Department of Mathematical Sciences must pass

- a qualifying examination,
- three comprehensive written examinations,
- a comprehensive oral examination,
- a series of courses, and
- a final oral doctoral thesis examination.

These are briefly described below. For more information, see the Graduate School requirements in this catalog, and the Mathematics

Graduate Student handbook at [www.math.nmsu.edu](http://www.math.nmsu.edu) (<https://www.math.nmsu.edu>).

## Qualifying Examination

Every student admitted to the Ph.D. program must complete the Ph.D. oral qualifying examination. Its purpose is to determine the areas in which the student shows strength or weakness, as well as the ability to assimilate subject matter presented at the graduate level. Students who complete their mathematics master's degree at NMSU may request, at the time of applying for their master's oral final examination, that the Master's examination also fulfill the Ph.D. qualifying examination requirement. In all other cases, towards the end of the student's first semester in the Ph.D. program, the student and his or her advisor will convene an oral examination with three examiners, the examiners being the advisor and some of the student's current or past instructors. As a result of the Qualifying examination, the department will take one of the following actions:

1. admit the student to further work toward the Ph.D.;
2. recommend that the student's program be limited to a Master's degree;
3. recommend a reevaluation of the student's progress after the lapse of one semester; or
4. recommend a discontinuation of the student's graduate program in mathematics.

## Written Comprehensive Examinations

Candidates for the Ph.D. degree must pass written comprehensive examinations in three of the seven areas of algebra, complex analysis, differential equations, logic and foundations, real analysis, statistics and topology. To ensure adequate breadth, a combination of three comprehensive examinations must include real analysis, and at least one of algebra and topology.

The seven examinations are based on the following comprehensive examination sequence courses:

<b>Algebra</b>		
MATH 525	Advanced Linear Algebra	3
MATH 581	Algebra I	3
MATH 582	Algebra II	3
<b>Complex Analysis</b>		
MATH 517	Complex Variables	3
MATH 591	Complex Analysis I	3
<b>Differential Equations</b>		
MATH 518	Fourier Series and Boundary Value Problems	3
MATH 531	Ordinary Differential Equations	3
MATH 532	Partial Differential Equations	3
<b>Logic and Foundations</b>		
MATH 504	Mathematical Logic	3
MATH 557	Axiomatic Set Theory	3
MATH 585	Universal Algebra	3
<b>Real Analysis</b>		
MATH 527	Introduction to Real Analysis I	3
MATH 528	Introduction to Real Analysis II	3
MATH 593	Measure and Integration	3

MATH 594	Real Analysis	3
<b>Probability and Statistics</b>		
STAT 562	Foundations of Probability	3
STAT 571	Continuous Multivariate Analysis	3
<b>Topology</b>		
MATH 541	Topology I	3
MATH 542	Topology II	3

Full time students should complete the comprehensive written exams in the first two years. Those who have not made substantial progress towards completion of their written exams at the start of the fifth semester may be removed from the program. Students who have not completed the written exams by the start of the sixth semester will normally have any departmental funding revoked.

Exams are offered every August and January. A student must register to take exams in the semester prior to taking the exams. A student has three consecutive examination periods to complete the written comprehensive exam requirements (Example: if s/he starts in August, s/he has the August, January and August examination periods to complete the exams). This does not extend the time limit mentioned above. Students will normally not be given more than two attempts at any one exam.

## Course Requirements

Before graduation, a student must pass a total of four comprehensive exam sequences, but needs to take the comprehensive examinations in only three of them. In addition, a student must pass four more (one-semester) MATH/STAT courses from the seven comprehensive exam sequences listed above.

A student may pass any of the four comprehensive examination sequences before enrolling as a Ph.D. student, but the four additional courses have to be passed after enrolling as a Ph.D. student.

The following courses will not count towards the course requirements:

Any course below MATH 501

MATH 511	Fundamentals of Elementary Mathematics I	3
MATH 512	Fundamentals of Elementary Mathematics II	3
MATH 513	Fundamentals of Algebra and Geometry I	3
MATH 516	Calculus with Hands-on Application	3
MATH 563	Algebra with Connections	3
MATH 564	From Number to Algebra	3
MATH 566	Data Analysis with Applications	3
MATH 567	From Measurement to Geometry	3
MATH 568	Using Number Throughout the Curriculum	3
MATH 569	Geometry with Connections	3
MATH/STAT 540	Directed Reading	1-6
MATH 599	Master's Thesis	15
MATH 600	Doctoral Research	1-15
MATH 700	Doctoral Dissertation	1-15

Students and advisors are encouraged to consider further courses beyond this minimum.

## Oral Comprehensive Exam

The student must take this exam at the end of the semester after completing the written comprehensive exams. The student should present a proposed direction for thesis work.

## Final Oral Exam

This should be an exam over the student's thesis and administered by the same committee of the oral comprehensive exam.

## Military Science

### Undergraduate Program Information

The Military Science program leads to a commission as an officer in the Army Reserve, National Guard or Active Duty Army. The program consists of four parts:

1. the student's academic major,
2. nondepartmental courses of value to the military service,
3. courses in military science and
4. a six-week Leader Development and Assessment course.

The department offers a four-year program divided into two parts: the basic course (two years) and the advanced course (two years). Selected students may qualify for the two-year program with prior military service or successful completion of a six-week summer Leaders' Training Course. Financial assistance and scholarships are available for qualified individuals. Students should contact the Department of Military Science to obtain additional information.

### Requirements

Courses should be taken in sequence, normally one per semester. The student's Military Science advisor will recommend course sequence. Military Science students must sign up for and attend courses plus laboratories. Departmental requirements may not be taken S/U.

#### Basic Course Freshman

M SC 110	Introduction to Military Science	2
M SC 111	Introduction to Leadership	2

#### Basic Course Sophomore

M SC 210	Self/Team Development	3
M SC 211	Leadership in Action and Team Building	3
M SC 225	Directed Studies	1-3

#### Advanced Course Junior

M SC 310	Leading Small Organizations I	3
M SC 310 L	Advanced Course Leadership Laboratories	1
M SC 320	Leading Small Organizations II	3
M SC 320 L	Leading Small Organization Lab	1
M SC 325	Advanced Directed Studies	1-3
M SC 350	Leadership Internship II	1-6

#### Advanced Course Senior

M SC 401	Leadership Challenges and Goal Setting	3
M SC 401 L	Advanced Course Leadership Laboratories	1
M SC 402	Transition to Lieutenant	3
M SC 402 L	Transition to Lieutenant Lab	1

M SC 425	Practicum	1-4
M SC 465	Leading Small Organization - Graduate Level	3
M SC 465 L	Advanced Course Leadership Lab - Graduate Level	1
M SC 501	Leadership Challenges and Goal Setting	3
<b>Nondepartmental Requirements</b>		
Select one course in Military History to meet Professional Military Education requirements. <sup>1</sup>		3
Total Credits		40-52

<sup>1</sup> See your Military Science advisor for specific courses.

## Minors for the Department

Military Science - Undergraduate Minor (p. 379)

### LTC Blanca E. Reyes, Department Head

**Assistant Professors and Staff** MAJ George W. Childs, MSG Ray L. Miller, SFC Scott Thrasher, SGT Brandon Cadena, CPT Michael Rivera, Mr. John Martin, Lisa I. Anthony, Patti Alarcon

## Military Science Courses

### M SC 110. Introduction to Military Science

#### 2 Credits (2+1P)

Concepts of leadership, including basic drill, fitness sessions, rappelling, first aid, map reading, and basic marksmanship. Optional physical fitness sessions and weekend exercises.

### M SC 111. Introduction to Leadership

#### 2 Credits (2+1P)

Learning and application of leadership, as well as relating organizational ethics to effective leadership using communication skills to improve individual performance. Optional physical fitness sessions and weekend exercises.

### M SC 210. Self/Team Development

#### 3 Credits (3+1P)

Learning and application of leadership skills to building effective teams, using oral/written skills, planning, and coordination of group efforts. Include advanced first aid, land navigation, and basic military tactics. Leadership Lab and three physical fitness sessions per week required.

### M SC 211. Leadership in Action and Team Building

#### 3 Credits (3+1P)

Individual and team aspects of military tactics in small unit operations. Use of radio, movement, planning for safety/security and pre-execution checks. Continued leadership development and techniques for training others. Leadership Lab and three physical fitness sessions per week required.

### M SC 225. Directed Studies

#### 1-3 Credits

Individual directed studies under supervision of designated faculty. May be repeated for a maximum of 12 credits. No S/U option.

**Prerequisite:** GPA 2.5 or better.

**M SC 310. Leading Small Organizations I****3 Credits**

Practical opportunities to lead small groups in situations of graduated complexity. Use of small unit defensive tactics and opportunities to conduct training for lower division students. Leadership Lab M SC 310L, three physical fitness sessions per week, and weekend exercises required.

**Prerequisite:** must meet Basic Course of Military Science requirements.

**Corequisite:** M SC 310L.

**M SC 310 L. Advanced Course Leadership Laboratories****1 Credit**

Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 310.

**Corequisite:** M SC 310.

**M SC 320. Leading Small Organizations II****3 Credits**

Delegation and supervision based on leadership case studies that require planning and adaptation to the unexpected in organizations under stress. Use of ethical decision making to enhance team performance. Leadership Lab M SC 310L, three physical fitness sessions per week, and weekend exercises required.

**Prerequisite:** M SC 310 or consent of instructor.

**Corequisite:** M SC 320L.

**M SC 320 L. Leading Small Organization Lab****1 Credit**

Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open to students taking M SC 320.

**Corequisite:** M SC 320.

**M SC 325. Advanced Directed Studies****1-3 Credits**

Directed individual study of advanced subjects. May be repeated for a maximum of 12 credits. No S/U option.

**Prerequisite:** GPA 2.5 or better.

**M SC 350. Leadership Internship II****1-6 Credits (1-6)**

Six-week paid internship conducted at an Army installation. Leadership-course environment is highly structured and demanding. Stresses leadership at small-unit levels under varying conditions. Evaluations during this required internship weigh heavily in type of commission and branch assignment offered.

**Prerequisite(s):** M SC 310, M SC 310L, M SC 320, and M SC 320L.

**M SC 401. Leadership Challenges and Goal Setting****3 Credits**

Planning, conducting and evaluating activities of the ROTC cadet organization, including the articulation of goals, and actuation of plans to attain them. Assessment of organizational skills and development of strategies to improve group cohesion through learning and application of Army policies and programs. M SC 401L, three physical fitness sessions per week, and weekend exercises required.

**Prerequisite:** M SC 320 or consent of instructor.

**Corequisite:** M SC 401L.

**M SC 401 L. Advanced Course Leadership Laboratories****1 Credit**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 401.

**Corequisite:** M SC 401.

**M SC 402. Transition to Lieutenant****3 Credits**

Continues methodology from M SC 401. Identification and resolution of ethical dilemmas along with counseling and motivation techniques. Examination of tradition and law as these issues relate to the Army officer and prepare the student to be a successful Army lieutenant. Leadership Lab M SC 402L, three physical fitness sessions per week and weekend exercises required.

**Prerequisite:** M SC 401 or consent of instructor.

**Corequisite:** M SC 402L.

**M SC 402 L. Transition to Lieutenant Lab****1 Credit**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution, and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 402.

**Corequisite:** M SC 402.

**M SC 425. Practicum****1-4 Credits**

Independent projects conducted under the direction of designated faculty, and concerned with analysis of selected leadership or management problems. May be repeated for a maximum of 16 credits. No S/U option.

**M SC 465. Leading Small Organization - Graduate Level****3 Credits**

Practical opportunities to lead small groups in situations of graduated complexity. Use of small unit defensive tactics and opportunities to conduct training for graduate students. Leader Lab M SC 465L, three physical fitness sessions per week and weekend exercises required. Research paper required. No S/U option.

**Prerequisite:** consent of PMS.

**Corequisite:** M SC 465L.

**M SC 465 L. Advanced Course Leadership Lab - Graduate Level****1 Credit**

Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 465.

**Prerequisite:** consent of PMS.

**Corequisite:** M SC 465.

**M SC 501. Leadership Challenges and Goal Setting****3 Credits (3+1P)**

Planning, conducting, and evaluating activities of ROTC cadet organization. Articulation of goals and plans to attain them. Assessment of organizational skills and development of strategies to improve group cohesion. Leadership lab, three physical fitness sessions per week, weekend exercise, and research paper required. Consent of instructor required.

**Prerequisite(s):** Consent of PMS.

**Corequisite(s):** M SC 401L.

**M SC 502. Transition to Lieutenant****3 Credits (3+1P)**

Continuation of M SC 501. Identification and resolution of ethical dilemmas. Counseling and motivation techniques. Examination of tradition and law for officers. Leadership lab, three physical fitness sessions per week, weekend exercises, and research paper required. Consent of instructor required.

**Prerequisite(s):** Consent of PMS.

**Corequisite(s):** M SC 402L.

**Phone:** (575) 646-4030

**Website:** <http://www.nmsu.edu/~armyrotc/>

## Military Science - Undergraduate Minor

The minor in Military Science is administered by the Department of Military Science (Army ROTC) in the College of Arts and Sciences. To obtain a minor in Military Science a student must complete a total of 19 credits, all of which must be upper division. A grade of C- or better must be obtained for each course. The only credits in which a grade of S will be accepted is M SC 350 Leadership Internship II. Students should contact the Department of Military Science to obtain additional information.

## Molecular Biology

### Graduate Program Information

Students of the molecular life sciences seek to reduce complex biological processes to a set of understandable molecular or chemical structure and function relationships. Integration of this knowledge into the context of complex living tissues interacting with the environment is the ultimate goal. This requires that the expertise from many diverse traditional disciplines be directed along converging experimental lines. The Ph.D. program in molecular biology is designed to facilitate an interdisciplinary approach to graduate research, utilizing both traditional techniques and the latest advances in biotechnology, including the extraordinary power of recombinant DNA methodology. Participants in this program will take core courses in biochemistry, molecular biology and cell biology. Subsequent course work will be tailored for the individual student, depending upon his or her research emphasis. Participation in regular seminar programs will be expected to provide students with the widest possible scientific background. Financial aid, in the form of a limited number of MB teaching and research assistantships, is available on a competitive basis. Research Assistantships may also be available from individual faculty within the Molecular Biology (MB) program. Only the most competitive students are admitted with assistantship support.

The MB program offers curricula leading to the MS and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MB Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and

laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 300 combined verbal and quantitative), TOEFL scores of foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding research performance or potential are weighted heavily during the selection process.

Students with a BS degree in one of the disciplines listed above can expect to earn the MS degree in about 30 credits, including at least 6 credits of thesis research. The Ph.D. degree can be earned in about 30 to 40 credits of formal course work, plus additional thesis research credits, for a minimum total of 75 credits beyond the BS. Because research is central in both the MS and Ph.D. curricula, early selection of a research advisor is required. Ph.D. degree candidates will successfully complete a written and oral qualifying examination based on their proposed research and the subject matter in the core courses (below) at the end of the first year of study. Also at this time, the master's or doctoral committee is organized to assist in planning a program appropriate to the background and goals of the student. Ph.D. candidates will subsequently complete a comprehensive written examination and oral examination approximately at the end of the second year of study. A final, formal presentation and oral defense of the original research documented in the MS or Ph.D. thesis completes the degree requirements.

## Degrees for the Department

Molecular Biology - Master of Science (p. 381)

Molecular Biology - Doctor of Philosophy (p. 381)

## Minors for the Department

Bioinformatics (with Computer Science) - Graduate Minor (p. 382)

Molecular Biology - Graduate Minor (p. 382)

Molecular Biology- Undergraduate Minor (p. 380)

A. Ashley, Ph.D. (Colorado State University)– Department of Chemistry and Biochemistry– cellular response to DNA replication stress and damage; maintenance of genomic integrity in eukaryotes; R. Ashley, Ph.D. (Colorado State University)– Department of Animal and Range Sciences– progesterone's actions mediated by membrane receptors, and chemokines' effects in early pregnancy and breast cancer; R. Creamer, Ph.D., (University of California-Davis)– Department of Entomology Plant and Weed Science– plant virology, fungal endophytes; D. Cowley, Ph.D. (University of Wisconsin-Madison)– Department of Fish, Wildlife and Conservation Ecology – ecological and conservation genetics; J. Curtiss, Ph.D. (University of Colorado-Boulder)– Department of Biology– molecular genetics of eye development; K. A. Hanley, Ph.D. (University of California San Diego)– Department of Biology– emerging vector-borne viruses; I. Hansen, Ph.D. (University of Wurzburg, Germany)– Department of Biology– molecular vector biology; S. Hanson (Wisconsin)– Department of Entomology Plant and Weed Science– viral plant pathogens; J. Hernandez Gifford, Ph.D. (Washington State University)– Department of Animal and Range Sciences– reproductive physiology; O. Holguin, Ph.D. (New Mexico State University)– Department of Plant and Environmental Sciences– biochemistry including etabolomics and proteomics with a focus on chemical analysis technique; J. Houston, Ph.D. (Texas A&M University)– Department of Chemical & Materials Engineering– biomedical engineering, flow cytometry, fluorescence dynamics, biophotonics, and instrumentation development; K. Houston,

Ph.D. (University of Texas)– Department of Chemistry and Biochemistry– hormonal carcinogenesis; E. Indriolo, Ph.D. (Purdue University) – Department of Biology – plant signaling, molecular biology; P. Lodato, Ph.D. (University of Chile)– Department of Biology– understanding post-transcriptional mechanisms regulating the assembly of the T3SS and Shiga toxin production; G. Lopez-Martinez, Ph.D. (Ohio State University)– Department of Biology– short and long-term effects that single and repeated bouts of environmental stress can have on animals; S. Lusetti, Ph.D. (University of Wisconsin-Madison)–Department of Chemistry and Biochemistry– DNA replication, recombination and repair; B. A. Lyons, Ph.D. (Cornell University)– Department of Chemistry and Biochemistry– structure and function relationships in breast and liver cancer cell signaling pathways; P. Mera, Ph.D. (University of Wisconsin-Madison)– Biochemistry/Toxicology– identify genetic modules that control cell proliferation in pathogenic bacteria in order to uncover novel targets for new antibiotics; B.G. Milligan, Ph.D. (University of California-Davis)– Department of Biology– plant evolutionary biology; M. K. Nishiguchi, Ph.D. (University of California-Santa Cruz)– Department of Biology– molecular and ecological basis of speciation, coevolution of symbiotic relationships; N. Pietrasiak, Ph.D. (University of California-Riverside)– Department of Plant and Environmental Sciences– cyanobacterial phylogenetics, molecular ecology of terrestrial algae, biocrusts; J. Randall, Ph.D. (New Mexico State University)– Department of Plant and Environmental Sciences– molecular plant physiology and plant/microbe interactions; I. Ray, Ph.D. (Wisconsin-Madison)– Department of Plant and Environmental Sciences– plant genetic engineering, primary and secondary metabolism, stress, legumes; C. Sengupta-Gopalan, Ph.D. (Ohio State)– Department of Plant and Environmental Sciences– nitrogen-fixation, plant-bacterial interactions; E. E. Serrano, Ph.D. (Stanford)– Department of Biology– neuroscience, genetics, science and ethics; C. B. Shuster, Ph.D., Program Director (Tufts University)– Department of Biology– regulation of mitosis and cytokinesis, role of the cytoskeleton during early development; G. Smith, Ph.D. (North Carolina State)– Department of Biology-environmental gene probes, microbial biodegradation; A. Summers, Ph.D. (University of Nebraska-Lincoln) – Department of Animal and Range Sciences– identification of strategic supplementation time points and nutrients during gestation to improve progeny growth, development and reproduction; W. Van Voohries, Ph.D. (Arizona)– Molecular Biology Program– animal and algae physiology; J. Xu, Ph.D. (Second Military Medical University, China)– Department of Biology– functional genomics and population genetics of mosquito-malaria interactions; E. Yukl (Oregon Health and Science University) – Department of Chemistry and Biochemistry– structural biology and bioinorganic chemistry; J. Zhang, Ph.D. (University of Arkansas)– Department of Plant and Environmental Sciences– cotton genetics, genomics and molecular biology

## Molecular Biology Courses

### **MOLB 448. Special Research Problems**

#### **1-3 Credits**

Individual investigation, theoretical or experimental, under the supervision of a molecular biology faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

### **MOLB 520. Molecular Cell Biology**

#### **3 Credits**

Same as BIOL 520.

### **MOLB 542. Biochemistry I**

#### **3 Credits**

Same as BCHE 542. B or better required.

### **MOLB 545. Molecular and Biochemical Genetics**

#### **3 Credits**

Same as BCHE 545 and BIOL 545.

### **MOLB 546. Biochemistry II**

#### **3 Credits**

Same as BCHE 546.

### **MOLB 590. Discussions in Molecular Biology**

#### **1 Credit**

Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and three times for doctoral students. Graded by 2 options: S/U or Letter Grade

### **MOLB 597. Laboratory Rotations/Research Discussions**

#### **1-3 Credits**

All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.

### **MOLB 598. Special Research Programs**

#### **1-3 Credits**

Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.

### **MOLB 599. Master's Thesis**

#### **1-15 Credits (1-15)**

Experimental and scholarly research leading to the preparation of a master's thesis.

### **MOLB 600. Molecular Biology Research**

#### **1-15 Credits**

Laboratory research efforts prior to successful completion of doctoral comprehensive exam.

### **MOLB 650. Advanced Topics in Molecular Biology**

#### **1-3 Credits**

Discussions and lectures on topics of current interest in molecular biology for doctoral students.

### **MOLB 698. Advanced Research Projects**

#### **1-9 Credits**

Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.

### **MOLB 700. Doctoral Dissertation Research**

#### **15 Credits**

Research for doctoral students after completing comprehensive exams.

**Name:** Molecular Biology Program - Office

**Office Location:** 361 Chemistry Building

**Phone:** (575) 646-3437

**Website:** <http://molb.research.nmsu.edu/>

## Molecular Biology- Undergraduate Minor

The Molecular Biology Program offers opportunities for students to gain theoretical training and hands-on experience in the methods of molecular biology, cellular biology, and/or bioinformatics. A formal undergraduate minor in Molecular Biology is offered and is described below; a grade of C or better is required to certify the courses. A minor in Bioinformatics is currently under development; for planning purposes, please refer to the

program office for the most recent drafts of the Bioinformatics minor requirements.

This program consists of a minimum of 18 hours, distributed through five or six areas.

<b>Organic Chemistry:</b>		4-5
CHEM 314	Organic Chemistry II	
CHEM 315	Organic Chemistry Laboratory	
CHEM 211	Organic Chemistry	
<b>Introductory Genetics:</b>		3
AGRO 305	Principles of Genetics	
ANSC 305	Principles of Genetics	
BIOL 305	Principles of Genetics	
HORT 305	Principles of Genetics	
<b>Cell Biology:</b>		3
BIOL 377	Cell Biology	
BIOL 490	Neurobiology	
<b>Advanced Genetics:</b>		3
BCHE 396	Biochemistry II	
BIOL 478	Molecular Biology of Microorganisms	
HORT 486	Materials from Biorenewable Resources	
<b>Additional Advanced Courses:<sup>1</sup></b>		5
BCHE 446	Biochemistry III	
BCHE 494	Biochemical Genetics Laboratory	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 477	Applied and Environmental Microbiology	
TOX 461	Toxicology I	
<b>Total Credits</b>		18-19

<sup>1</sup> Additional credit hours from the following, or additional courses from any of the above five areas, as needed to meet a minimum of 18 credit hours

Successful completion of the minor will be certified by the Molecular Biology Program. A grade of "C" or better is required of all minor courses.

## Molecular Biology - Master of Science

The MB program offers curricula leading to the MS and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MB Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 300 combined verbal and quantitative), TOEFL scores of

foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding research performance or potential are weighted heavily during the selection process.

Students with a BS degree in one of the disciplines listed above can expect to earn the MS degree in about 30 credits, including at least 6 credits of thesis research. Because research is central in both the MS and Ph.D. curricula, early selection of a research advisor is required. The master's committee is organized to assist in planning a program appropriate to the background and goals of the student. A final, formal presentation and oral defense of the original research documented in the MS thesis completes the degree requirements.

MS candidates must enroll in MOLB 599 Master's Thesis for 6 credits. May register for additional credits to maintain full-time status.

## Molecular Biology - Doctor of Philosophy

### Phase I Core Courses

MOLB 520	Molecular Cell Biology	3
MOLB 542	Biochemistry I	3
MOLB 545	Molecular and Biochemical Genetics	3

### Molecular Biology Tier II Courses

Select at least 9 credits from the following: 9

AGRO 506	Plant Genetics	
AGRO 516	Molecular Analysis of Complex Traits	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	
BCHE 494	Biochemical Genetics Laboratory	
BCHE 546	Biochemistry II	
BCHE 647	Physical Biochemistry	
BIOL 451	Physiology of Microorganisms	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 490	Neurobiology	
BIOL 541	Professional Development Seminar	
BIOL 550	Special Topics	
BIOL 577	Advanced Topics in Environmental Microbiology	
BIOL 590	Neuroscience	
BIOL 698	Selected Topics	
CHEM 516	Physical Organic Chemistry	
CHEM 517	Synthetic Organic Chemistry	
EPWS 486	Plant Virology	
MOLB 546	Biochemistry II	
MOLB 650	Advanced Topics in Molecular Biology	
TOX 461	Toxicology I	

**Other Course Requirements**

A ST 505	Statistical Inference I (or equivalent course)	4
MOLB 590	Discussions in Molecular Biology	1
MOLB 597	Laboratory Rotations/Research Discussions	1-3
MOLB 599	Master's Thesis <sup>1</sup>	6
Total Credits		30-32

<sup>1</sup> MS candidates must enroll for 6 credits MOLB 599 Master's Thesis. May register for additional credits to maintain full-time status.

The Molecular Biology program also offers formal minors in molecular biology or bioinformatics.

## Bioinformatics (with Computer Science) - Graduate Minor

The Bioinformatics minor is jointly offered with the Department of Computer Science and consists of 9 credit hours for Master's students and 12 credit hours for Ph.D. students, including BIOL 550 Special Topics/GENE 452 Applied Bioinformatics, and additional courses selected from those listed at <http://research.nmsu.edu/molbio/>. The courses selected will depend on whether the student is majoring in a biological or non-biological science and include courses from the graduate Computer Science and Molecular Biology curricula. Please inquire with the Molecular Biology Program office for the most recent requirements for the bioinformatics minor.

## Molecular Biology - Graduate Minor

The Molecular Biology Minor consists of 10 credit hours including MOLB 545; either MOLB 520 or MOLB 542; any of the tier II courses; and one MOLB 590 seminar.

**Required Courses**

MOLB 545	Molecular and Biochemical Genetics	3
MOLB 520	Molecular Cell Biology	3
or MOLB 542	Biochemistry I	
MOLB 590	Discussions in Molecular Biology	1

**Molecular Biology Tier II Courses**

Select one from the following:		3
AGRO 506	Plant Genetics	
AGRO 516	Molecular Analysis of Complex Traits	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	
BCHE 494	Biochemical Genetics Laboratory	
BCHE 546	Biochemistry II	
BCHE 647	Physical Biochemistry	
BIOL 451	Physiology of Microorganisms	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	

BIOL 478	Molecular Biology of Microorganisms
BIOL 490	Neurobiology
BIOL 541	Professional Development Seminar
BIOL 550	Special Topics
BIOL 577	Advanced Topics in Environmental Microbiology
BIOL 590	Neuroscience
BIOL 698	Selected Topics
CHEM 516	Physical Organic Chemistry
CHEM 517	Synthetic Organic Chemistry
EPWS 486	Plant Virology
MOLB 546	Biochemistry II
MOLB 650	Advanced Topics in Molecular Biology
TOX 461	Toxicology I

Total Credits 10

## Music

### Undergraduate Program Information

#### Mission Statement

The mission of the Music Department at NMSU is:

1. to prepare students for careers in music education, business and/or performance;
2. to give the student body opportunities to perform, study, create and experience music;
3. to enhance the cultural lives of our constituency by performance of superior music; and
4. to create an artistic environment which fosters the development of personal realizations we believe to be essential to the fabric of a healthy society.

All students are required to meet the State Common Core as listed in earlier sections of this catalog. Please see a Music Department advisor for a specific list of courses.

#### Admission into the Program

For a student to be officially accepted as a Music major or minor, he/she must do the following:

- perform an audition for a panel of no less than three Music faculty members
  - one of whom must be the director of his/her program area
  - one of whom must be the applied teacher of the student's principal instrument
- provide recommendation letters from at least two music professionals
- take a Music Theory placement exam

Any student declaring Music as his/her major may be accepted for a one-semester probationary period. During that first semester, the Music faculty will determine if the student has the necessary skills and work ethic to continue as a major. The student's course work, ensemble participation and applied jury will be the basis for the decision to allow the student to continue or not.

## Departmental Requirements for all Bachelor's Degrees (Music Core)

A student must earn a grade of C- or better in all departmental requirements for any degree in the Department of Music. All students wishing to pursue a music degree must audition and take the theory placement exam. Contact the department for current audition requirements.

If students change major(s) or minor(s) or do not complete the requirements for the minor at the time of graduation, they may only count a maximum of 9 credits of the applied/occupational credits toward graduation.

## Recital Requirements for all Music Degrees

### Bachelor of Music

All performance majors are required to give a half recital (30 minutes of music) in the junior year and a full recital (60 minutes of music) in the senior year. Students taking the Music Business option will give a half recital in their major performance area.

### Bachelor of Music Education

All music education majors will give a half recital (30 minutes of music) in their major performance area.

## Applied Music Requirements for All Music Degrees

All Music degrees require at least two semesters of applied music study at the 430 level.

All students enrolling in applied music will audition and obtain permission from an applied teacher before enrolling for applied music credit.

Students may obtain further information by contacting the music department.

## Other Music Requirements, Fees and Regulations

1. A Piano Proficiency Examination is required of all music majors. Each student must enroll in Functional Piano or Applied Piano every semester, until the Proficiency is passed. Detailed requirements may be obtained from the Department of Music office. Students must pass the piano Proficiency Exam before presenting a Senior Recital.
2. Qualitative grade-point average for graduation in music is 2.0 or higher. All grades in required music courses must be C- or better.
3. A Music Theory Placement Examination is required of all entering freshman and transfer students.
4. An instrument rental fee is charged each semester for students using university instruments. Consult the music department concerning these fees.
5. All applied students pay an additional fee. Consult the music department concerning these fees.
6. Outside groups and individuals must have special permission to use music department facilities. Contact the music office for additional information.

## Music Ensembles

All students majoring or minoring in Music, must enroll and participate in the ensemble appropriate for their particular degree plan. The appropriate ensemble will be determined by degree requirements in consultation with the student's advisor and ensemble directors. The student must enroll each and every semester he/she is considered full-time until the degree requirements are met, for a minimum of 8 semesters (7 semester for Music Education majors). Any student receiving any kind of financial assistance through the Music Department must enroll each and every

semester while he/she is attending NMSU. Music Education Students will not receive Music Scholarship funds during their semester of Student Teaching. For more information, contact the Music Office.

## Music Scholarships and Awards

A limited number of performance stipends and other music scholarships are available to any full-time registered student and are awarded through the department. Amounts awarded will reflect excellence and achievement in performance, determined by audition—either in person or by a recording—and references.

For more information on performance stipends and other music scholarships and awards, write to:

Department of Music  
PO Box 30001, MSC 3 F  
Las Cruces, New Mexico 88003-8001  
E-mail: music@nmsu.edu.

## Graduate Program Information

The Master of Music degree is offered in the following areas of study: Conducting, Music Education and Performance. Applicants are expected to have an undergraduate degree in music or music education equivalent to that represented by the BM or BME degree from New Mexico State University. The music department does not require the Graduate Record Exam, but does expect each applicant to possess graduate-level language and writing skills. For admission into the Master of Music degree program, all applicants must have an undergraduate GPA of at least 3.0 and submit at least three letters of recommendation from music professionals. An audition, either in person or by recording, is required for entrance into the Performance or Conducting programs. Auditions will be based upon, but not limited to, prescribed repertory.

For acceptance into the Music Education program, the applicant must have completed a Bachelor of Music Education degree comparable to the one offered by NMSU or take the requisite undergraduate courses at NMSU leading to state licensure before enrolling in graduate courses. (Contact the Music Department for details.)

*Note: The degree offered is a Master of Music. The student's official transcript and diploma will only indicate that degree. The area of study (Conducting, Music Education, Performance) will not be included as part of the official degree title.*

## Recital Requirements for Performance and Conducting

A graduate recital plus an analytical paper are required of all candidates in Performance and Conducting. Students must be enrolled in their applied area during the semester the recital is given. A minimum of 60 minutes of music is required for all Performance recitals. A minimum of three major works for the appropriate ensemble is required for all Conducting recitals. The recital may only be given after at least 6 hours of graduate applied or conducting courses have been successfully completed.

## Program of Study and Committee Selection

After admission, each student must successfully complete MUS 471 Graduate Theory Review before subsequent enrollment in other music theory courses. He or she must also successfully complete MUS 477 Graduate Music History Review before subsequent enrollment in other music history courses.

During the first semester of study, a tentative Program of Study is planned, documented and filed by the student in consultation with

the advisor in his or her major field. The Program of Study is subject to approval by the Music Department Head and the Graduate Music Committee. The student will also select, in consultation with his or her advisor, an advisory committee consisting of the advisor, and two additional faculty members.

## Candidacy

In order to qualify for candidacy the student (except those in the online Music Education program) must meet the Graduate School requirement of 12 credits of graduate work in residence and must show evidence of a satisfactory quality of work in the required courses, demonstrate the desired progress in his or her performance area and, where required, submit a recital program, thesis topic, or project proposal for approval.

## Thesis

A thesis is optional in Music Education and is encouraged for students considering completion of a terminal degree. Music Education candidates not writing a thesis must develop and complete an approved project before the oral examination.

## Final Examination

All Master of Music candidates must take a final comprehensive oral examination. The final oral examination may not be scheduled until the graduate recital (with analytical paper) is completed or a final draft of the Music Education project or thesis has been approved by the candidate's advisor.

## Fees

Fees, in addition to tuition, will be assessed for all applied hours and recitals. (Consult the Music Department for details).

## Degrees for the Department

Music - Bachelor of Music (p. 391)

Music Education - Bachelor of Music Education (p. 393)

Music - Master of Music (p. 395)

## Minors for the Department

Music - Undergraduate Minor (p. 395)

### Professor, Lon W. Chaffin, Department Head

**Professors** Kaplan, Romero, Shearer; **Associate Professors** Bugbee, Daughtrey, Joy, Martinez-Rios, Spitzer, Vega-Albela; **Assistant Professors** Espinoza, Gollo, Mapp, Smyth, L. Van Winkle; **College Associate Professors** Taylor; **College Instructor** Brennan

*L. Chaffin, Department Head, Ph.D. (Texas Tech)– theory, composition; K. Brennan, D.M.A. (Michigan State)–double reeds, theory; F. Bugbee, D.M.A. (Eastman School of Music)– percussion, history; S. Daughtrey, D.M. (Indiana University)– vocal coordinator, diction, pedagogy; S. Gollo (Conservatoire de Musique, Switzerland)– Orchestra Director, violin; N. Joy, M.M. (NMSU)– horn, Music Education; A. Kaplan, Ph.D. (NYU Manhattan School of Music)– low brass; M. Mapp (Kansas University)- Director of Bands, conducting; J. Martinez-Rios, M.M (Western Michigan)– viola; F. Romero, D.M.A. (University of Oklahoma)– trumpet, jazz; J. Shearer, D.M.A. (Eastman School of Music)– graduate coordinator, history; S. Smyth, D.M.A. (Kansas University)- Athletic Bands, music education; L. Spitzer, D.M.A. (USC)– piano, history; R. Taylor, D.M.A (Arizona)– saxophone, theory; L. Van Winkle, D.M.A. (Arizona) flute, ear-training; D. Vega-Albela M.M. (Western Michigan)–violin*

## Music Courses

### MUS 101G. An Introduction to Music

#### 3 Credits

An introduction to music for the non-music major to encourage the enjoyment of listening to and understanding the world's great music from the past to the present.

### MUS 102. Fundamentals of Music

#### 3 Credits

Introduction to music notation, meter and rhythm, scales, intervals, triads, seventh chords, fundamentals of harmonic progression, and aural skills. For students with little or no music theory background. Traditional Grading with RR.

### MUS 103. Ear Training I

#### 1 Credit

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Traditional Grading with RR. Restricted to Las Cruces campus only.

**Prerequisite(s):** Passing the Theory Placement exam or making a C or better in MUS 102.

### MUS 104. Ear Training II

#### 1 Credit

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C- or better in MUS 103.

### MUS 105. Music Theory I

#### 3 Credits

Introduction to vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis.

**Prerequisite(s):** Passing the Theory Placement exam or making a C or better in MUS 102.

### MUS 106. Music Theory II

#### 3 Credits

Expansion of vocabulary and syntax of 4-voice 18th c. chorale music through study, harmonic analysis, and part writing.

**Prerequisite(s):** Grade of C or better in MUS 105.

### MUS 121. Concert and Recital Laboratory

#### 0.5 Credits

Serves as a resource and performance lab for all applied areas of musical study. Music majors are expected to perform during the weekly student recital and must attend a designated number of musical performances during the semester. May be repeated up to 4 credits. Restricted to: Music and Music Education majors. S/U Grading with RR. Restricted to Las Cruces campus only.

### MUS 130. Applied Music

#### 1-2 Credits

Private or group instruction for non-music majors, secondary instruments, and music majors preparing for 200-level applied music. May be taken for unlimited credit.

### MUS 141. Class Voice I

#### 1 Credit

Group instruction in voice and vocal pedagogy for instrumental Music Education majors, offering basic principles of healthy vocal production with particular attention to diction, development of vocal range, and the ability to impart that knowledge to elementary, junior and/or high school age students. Restricted to: Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

**MUS 145. Functional Piano I****2 Credits**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**MUS 146. Functional Piano II****2 Credits**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**Prerequisite:** MUS 145 or consent of instructor.

**MUS 147. Functional Piano III****2 Credits**

For music majors preparing for the Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**Prerequisite:** MUS 146 or consent of instructor.

**MUS 150. Orchestra****1 Credit**

Participation in the Las Cruces Symphony at NMSU. This is a full symphony orchestra concentrating on masterworks of the literature. May be taken for unlimited credit.

**MUS 151. Philharmonic Orchestra****1 Credit**

The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 160. University Singers****1 Credit**

Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 161. Concert Choir****1 Credit**

Campus choir composed of both music and non-music majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. May be taken for unlimited credit.

**MUS 162. Master Works Chorus****1 Credit**

Combination campus and community chorus. This group will perform the major chorale compositions for orchestra and/or wind ensemble. May be taken for unlimited credit.

**MUS 163. Jazz Ensembles****1 Credit**

Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 164. Chamber Ensembles****1 Credit**

Small groups of singers and/or instrumentalists that perform chamber music. May be repeated up to 16 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 170. Wind Symphony****1 Credit**

This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 171. Roadrunner Revue Pep Band****1 Credit**

For both music and nonmusic majors. Opportunity to perform a variety of music in a showband setting. May be taken for unlimited credit.

**Prerequisite:** by audition only; contact band office for date and time.

**MUS 172. Marching Band****1 Credit**

For both music and nonmusic majors. Opportunity to perform all varieties of music in a contemporary styled marching unit. May be taken for unlimited credit.

**MUS 174. Percussion Ensemble****1 Credit**

Study and performance of contemporary percussion ensemble literature. May be repeated up to 5 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 180. Symphonic Band****1 Credit**

This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 181. Campus Band****1 Credit**

This is a non-auditioned ensemble designed to meet the needs of students from all majors across campus. Music majors are encouraged to enroll while performing on a secondary instrument. Marching band members are also encouraged to take the course to build skills and leadership. This ensemble provides an educational experience and serves as an outlet for students who wish to remain musically active in a less intense setting. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**MUS 201G. History of Jazz in Popular Music: A Blending of Cultures****3 Credits**

Jazz in popular music as it relates to music history and the development of world cultures.

**MUS 202. An Introduction to World Music, Jazz and Music Research**  
**3 Credits**

Introduces world music and jazz within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works. A major component will be the development of effective research and scholarly writing skills for the music major or minor. May be repeated up to 3 credits. Restricted to: Music majors and minors. majors. Restricted to Las Cruces campus only.

**MUS 203. Ear Training III**  
**1 Credit**

Continuation of MUS 104, advanced sight singing, dictation. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C- or better in MUS 104.

**MUS 204. Ear Training IV**  
**1 Credit**

Continuation of MUS 203, advanced sight singing, dictation. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C or better in MUS 203 and MUS 205.

**MUS 205. Music Theory III**  
**3 Credits**

Analysis of Baroque and Classical Music. Vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C or better in MUS 106.

**MUS 206. Music Theory IV**  
**3 Credits**

Analysis of Romantic, Post-Romantic, Impressionist, and Twelve-Tone Music. Vocabulary and syntax of late 19th and early 20th c. Western art music through study, micro/macro analysis, and composition. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C or better in MUS 205.

**MUS 207. Music History and Literature: Antiquity through Baroque**  
**3 Credits**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from antiquity through the end of the Baroque era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: M ED, MUS majors.

**Prerequisite(s):** A grade of C- or better in MUS 103, 105, and 202.

**MUS 230. Applied Music I**  
**1-4 Credits**

Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

**Prerequisite(s):** Audition.

**MUS 250. Introduction to Music Education**  
**2 Credits**

Overview of the basic principals and practices of the music education profession in K-12 settings, emphasizing philosophy and history of music education, methodologies commonly utilized in school curricula, music in special education, classroom/rehearsal management and lesson planning. Explores many aspects of public school teaching through class discussions and directed observations. Restricted to Las Cruces campus only.

**MUS 251. Opera Workshop**  
**1 Credit**

Study, translation, analysis, rehearsal and performance of opera. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 260. Special Topics I**  
**1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

**MUS 261. Functional Piano IV**  
**2 Credits**

For music majors preparing for Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**Prerequisite:** MUS 147 or consent of instructor.

**MUS 262. Diction I**  
**2 Credits**

Introduction to the international phonetic alphabet, and its application to English, Italian, Spanish, and Latin song literature. Main campus only. Restricted to Las Cruces campus only.

**MUS 263. Diction II**  
**2 Credits**

Advanced grammar and detailed study of Italian, German and French diction and song literature for vocal students. Restricted to music majors. Main campus only.

**Prerequisite:** MUS 262 or consent of instructor.

**MUS 273. Introduction to Music Technology**  
**1 Credit**

Introduction to uses of technology in musical settings. Practical applications in digital music notation, MIDI sequencing, and digital audio recording. Restricted to: MUS, M ED majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

**Prerequisite(s):** MUS 105.

**MUS 301. Marching Band Techniques**  
**2 Credits**

This course will help students develop the techniques needed to administer and teach all aspects of a contemporary high school marching band. This includes drill conception and design, instruction, organization, and administration. Stylistic varieties of marching fundamentals, show conception, fundamentals of charting and teaching drill, computer-aided drill design, traditional show design, contemporary show design, rehearsal techniques, and organizational concepts. Restricted to: Music, Music Education majors. Traditional Grading with RR.

**MUS 302. Music History and Literature: Classic through Romantic**  
**3 Credits**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginnings of the Classic era through the end of the Romantic era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: Music Majors and Minors majors.

**Prerequisite(s):** A grade of C- or better in MUS 207.

**MUS 303. Music History and Literature: 20th Century Through the Present****3 Credits**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginning of the 20th Century through the Present. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: MUS minors and majors.

**Prerequisite(s):** A grade of C- or better in MUS 302.

**MUS 315. Brass Techniques I****1 Credit**

Methods and techniques of teaching high brass instruments, for music education majors. Main campus only.

**MUS 316. Brass Techniques II****1 Credit**

Methods and techniques of teaching low brass instruments, for music education majors. Main campus only.

**MUS 317. Woodwind Techniques I****1 Credit**

Methods and techniques of teaching high woodwind instruments, for music education majors. Main campus only.

**MUS 318. Woodwind Techniques II****1 Credit**

Methods and techniques of teaching saxophone and double reed instruments, for music education majors. Main campus only.

**MUS 319. String Techniques I****1 Credit**

Methods and techniques of teaching low string instruments, for music education majors. Main campus only.

**MUS 320. String Technique II****1 Credit**

Methods and techniques of teaching high string instruments, for music education majors. Main campus only.

**MUS 321. Instrumental Techniques for Vocal Music Education Majors****2 Credits**

Methods of teaching brass, woodwind, percussion, stringed and fretted instruments for vocal music education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 322. Guitar Methods****1 Credit**

Methods and techniques of teaching guitar, for Music Education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 323. Percussion Technique I****1 Credit**

Methods and techniques of teaching fundamental percussion instruments (snare drum, timpani, keyboards and essential accessories). May be repeated up to 1 credits. Restricted to: MUS,M ED majors.

**MUS 324. Percussion Technique II****1 Credit**

Methods and techniques of teaching marching percussion, drum set, and a continuation of techniques discussed in MUS 323. May be repeated up to 1 credits. Restricted to: MUS,M ED majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C- or better in MUS 323.

**MUS 325. Beginning Conducting****1 Credit**

A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning technique applicable to all ensembles. Reading of musical scores with application via laboratory ensemble experience is included. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 204 and 206.

**MUS 326. Instrumental Conducting****3 Credits**

Will continue from MUS 325 in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques as it relates to the instrumental ensemble. The class will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. May be repeated up to 3 credits. Restricted to: MUS,M ED majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C- or better in MUS 325.

**MUS 327. Choral Conducting****3 Credits**

Continuation of conducting study with emphasis on choral rehearsal techniques, ensemble management, and literature. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 325.

**MUS 330. Applied Music II****1-4 Credits**

Continuation from MUS 230. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 230 plus a juried audition.

**MUS 339. Survey of Music Business****3 Credits**

Survey of career options and exploration of current events/trends within the Music Industry. Non-Music Business majors may be admitted with instructor's approval.

**MUS 340. Junior Recital****1 Credit**

Public solo performance under the supervision of the appropriate applied instructor. 30 minutes of musical performance is required. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Corequisite(s):** MUS 330.

**MUS 346. Elementary Music Methods****2 Credits**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in an elementary school. Emphasis on methodology of Kodaly and Orff, teaching in a multicultural setting, and developing reflective practitioners. This course requires field experience in the public schools. Restricted to: Music Education majors.

**Prerequisite(s):** A grade of C or better in MUS 250 and passing the TEP exam.

**MUS 349. Secondary Music Methods****2 Credits**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on teaching in a multicultural setting and developing reflective practitioners. Restricted to: Music Education majors.

**Prerequisite(s):** A grade of C or better in MUS 346.

**MUS 350. Chamber Music****1 Credit**

Small performing ensembles that may include strings, woodwinds, brass, pianos, percussion, and voices. May be repeated up to 16 credits.

**Prerequisite(s):** by audition only.

**MUS 351. Opera Workshop****1 Credit**

Study, translation analysis, rehearsal and performance of opera. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 360. Special Topics II****1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

**MUS 361. Concert Choir II****1 Credit**

Composed of both music and nonmusic majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. Students must assume leadership role. May be repeated up to 88 credits.

**Prerequisite(s):** by audition only.

**MUS 362. Philharmonic Orchestra II****1 Credit**

The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 363. Jazz Ensembles II****1 Credit**

Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 365. Composition I****2 Credits**

Significant forms for various media. Emphasis on structural aspects of original composition. Restricted to: M ED, MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 105.

**MUS 368. University Singers II****1 Credit**

Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits. Consent of Instructor required.

**Prerequisite(s):** by audition only.

**MUS 370. Wind Symphony II****1 Credit**

This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 372. Marching Band II****1 Credit**

Composed of both majors and nonmajors. Opportunity to perform all varieties of music in a contemporary style marching unit. May be repeated up to 5 credits. Consent of Instructor required. Traditional Grading with RR.

**MUS 374. Percussion Ensembles II****1 Credit**

Study and performance of contemporary percussion ensemble literature. Students must assume a leadership role. May be repeated up to 5 credits.

**Prerequisite(s):** by audition only.

**MUS 380. Symphonic Band II****1 Credit**

This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 381. Campus Band II****1 Credit**

This is a non-auditioned ensemble designed to meet the needs of students from all majors across campus. Music majors are encouraged to enroll while performing on a secondary instrument. Marching band members are also encouraged to take the course to build skills and leadership. This ensemble provides an educational experience and serves as an outlet for students who wish to remain musically active in a less intense setting. May be repeated up to 10 credits.

**MUS 386. Applied Music Pedagogy and Literature I****2 Credits**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 390. Survey of Wind Literature****2 Credits**

An examination of beginning to advanced literature for wind bands with an emphasis on the needs of middle and high school ensembles. It will include a means to determine the quality of a piece as well as the standardized level of difficulty (grading). Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C- or better in MUS 204 and 206.

**MUS 391. Survey of Orchestral Literature****2 Credits**

An examination of beginning to advanced literature for both string orchestra and symphony orchestra with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C- or better in MUS 204 and 206.

**MUS 392. Survey of Choral Literature****2 Credits**

An examination of beginning to advanced literature for choir with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C- or better in MUS 204 and 206.

**MUS 413. Form and Analysis****3 Credits**

Forms in tonal music and basic analytic techniques including music from diverse cultures and media.

**Prerequisite(s):** A grade of C- or better in MUS 204 and MUS 206.

**MUS 415. Orchestration****3 Credits**

Scoring for full orchestra and various instrumental combinations with consideration of instrument timbres, strengths, weaknesses and ranges. Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C or better in MUS 204 and 206.

**MUS 417. Studio Accompanying****2 Credits**

Practical application of collaborative piano skills in a studio setting for Piano Performance majors. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 421. Music of the Baroque Era****3 Credits**

An overview of the music of the Baroque era with an emphasis on history and literature.

**Prerequisite(s):** MUS 303.

**MUS 422. Music of the Classic Era****3 Credits**

An overview of the music of the Classic era with an emphasis on history and literature.

**Prerequisite(s):** MUS 303.

**MUS 423. Music of the Romantic Era****3 Credits**

An overview of the music of the Romantic era with an emphasis on history and literature.

**Prerequisite(s):** MUS 303.

**MUS 429. Opera and Music Drama****3 Credits**

Lyrical drama of the Greeks through works of Wagner and Verdi to contemporary opera.

**Prerequisite:** MUS 303 or consent of instructor.

**MUS 430. Applied Music III****1-4 Credits**

Continuation from MUS 330. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 330 plus a juried audition.

**MUS 440. Senior Recital****1-2 Credits (1-2)**

Public solo performance under the supervision of the appropriate applied instructor. 60 minutes of musical performance is required for enrollment of 2 hours credit. 30 minutes of musical performance is required for enrollment of 1 hour credit. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Corequisite(s):** MUS 430.

**MUS 441. Supervised Studio Teaching****2 Credits**

Teaching of private lessons under supervision. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 450. Research Methods****3 Credits**

Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Restricted to majors. Main campus only. No S/U option.

**Prerequisite:** consent of instructor.

**MUS 451. Orchestra II****1 Credit**

Las Cruces Symphony at NMSU, a full symphony orchestra concentrating on masterworks of the literature. Students must assume a leadership role. May be repeated up to 88 credits.

**Prerequisite(s):** by audition only.

**MUS 455. Music Business Internship****3 Credits**

Capstone course for the Music Business degree. Working with the music business coordinator, students must have been accepted as an intern in a music business setting before enrolling. Credit given for the internship based on criteria developed for each placement. Restricted to majors. S/ U only.

**Prerequisites:** MUS 330 and piano proficiency.

**MUS 470. Special Topics III****1-3 Credits**

Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit.

**MUS 471. Graduate Theory Review****3 Credits**

Comprehensive and accelerated study of modes, diatonic harmony, and classical form of the common practice period. Restricted to: Music majors. Traditional Grading with RR.

**MUS 475. Intermediate Conducting****3 Credits**

Serves as a bridge from undergraduate conducting study to the graduate level. Advanced undergraduate students may enroll to learn how the graduate program in conducting functions. The course also serves as the introductory experience for newly admitted graduate conducting majors. After successful completion of this course, students will be able to: Study musical scores from a conducting perspective; Demonstrate effective predetermined gestures and movements; Lead an ensemble; Research and give presentations related to composers and their music; Demonstrate advanced knowledge of conducting practices.

**Prerequisite(s):** A grade of C- or better in MUS 326 or 327.

**MUS 477. Graduate Music History Review****3 Credits**

Comprehensive and accelerated study of music history from antiquity to the present. Restricted to: Music majors. Traditional Grading with RR.

**MUS 486. Applied Music Pedagogy and Literature II****2 Credits**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music majors. Traditional Grading with RR.

**MUS 498. Independent Study****1-3 Credits**

For students with a strong musical background wishing to explore content beyond the traditional curriculum. Restricted to majors. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**MUS 511. Survey of Traditional Harmony****3 Credits**

Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Restricted to: Music majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of B or better in MUS 471.

**MUS 513. Twentieth Century Art Music****3 Credits**

Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school in historical context. Restricted to: Music majors.

**Prerequisite(s):** A grade of B or better in MUS 471.

**MUS 518. Seminar in Music Theory****3 Credits**

Varying topics in Music Theory, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: Music majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of B or better in MUS 471.

**MUS 519. Seminar in Music History****3 Credits**

Varying topics in Music History, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 520. Music of the Middle Ages and Renaissance: History and Literature****3 Credits**

An overview of the music of the Middle Ages and Renaissance with an emphasis on history and literature. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 521. Music of the Baroque Era: History and Literature****3 Credits**

An overview of the music of the Baroque Era with an emphasis on history and literature.

**MUS 522. Music of the Classical Era: History and Literature****3 Credits**

An overview of the music of the Classical era with an emphasis on history and literature. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 523. Music of the Romantic Era: History and Literature****3 Credits**

An overview of Romantic era music, with an emphasis on history and literature. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 527. History and Analysis of the Symphony****3 Credits**

Historical background and development of the symphony from its inception (ca. 1740s) to mid-twentieth century. Analysis of major works by significant composers with emphasis on Sonata form. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 471 and 477.

**MUS 528. The Symphony in Historical Context****3 Credits**

Considers the historical development of the symphony, as a musical genre, from its inception to the 20th century. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 529. Opera and Music Drama****3 Credits**

Lyric drama of the Greeks through works of Wagner and Verdi to contemporary opera. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 530. Seminar in Music Education****3 Credits**

Varying topics in Music Education, providing a more specific and in-depth study of the particular topic. Restricted to: MUS majors.

**MUS 531. Music in Elementary Schools****3 Credits**

This course is designed to provide experiences which will help the student gain skills to appropriately enhance the musical growth of children in K-6 classrooms. The course participants personal skill and understanding of musical concepts will be developed; musical needs and capabilities of young children will be investigated; methods of teaching music to young children will be explored. Restricted to: MUS (Music Ed track only) majors.

**MUS 535. Current Issues in Music Education****3 Credits**

This course examines the rich and challenging complexities of music teaching and learning from a variety of perspectives. Educational theory to pedagogical inquiry of current educational practice will be examined, calling students to critically reflect on such professional activities as lesson planning, curriculum design, repertoire choice, program assessment, advocacy in the arts, and student evaluation. Restricted to: MUS (Music Ed track only) majors.

**MUS 540. Graduate Recital/Analytical Paper****4 Credits**

This course is for students completing a Master of Music with a Performance emphasis. A public recital will be given and an accompanying research paper will be submitted. Restricted to: MUS majors.

**MUS 574. Advanced Choral Conducting I****3 Credits**

This course will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 575. Advanced Choral Conducting II****3 Credits**

This is the final course in preparation for the student's graduate conducting concert. It will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 574.

**MUS 576. Advanced Instrumental Conducting I****3 Credits**

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 577. Advanced Instrumental Conducting II****3 Credits**

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 576.

**MUS 578. Advanced Choral Literature****2 Credits**

An examination of significant choral works from 1200 to the present, including composers, genres, and historical context Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 579. Advanced Instructional Literature****2 Credits**

An examination of significant instrumental works from the Baroque period to the present, including composers, genres, and historical context Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 580. Ensemble Performance****1 Credit**

Performance in university ensembles. May be repeated up to 99 credits.

**Prerequisite(s):** by audition only.

**MUS 582. Applied Music****2-4 Credits**

For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. May be repeated for a maximum of 16 credits.

**Prerequisites:** audition and consent of instructor.

**MUS 586. Applied Music Pedagogy and Literature III****2 Credits**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 486.

**MUS 598. Special Research Programs****1-4 Credits**

May be taken for unlimited credit.

**MUS 599. Master's Thesis****15 Credits**

Thesis.

**Phone:** (575) 646-2421

**Website:** <http://music.nmsu.edu/>

## Music - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

### Concentration: Instrumental Performance Requirements - Basic Music and Performance

**Music Theory and Ear Training**

MUS 103	Ear Training I	1
MUS 105	Music Theory I	3
MUS 203	Ear Training III	1
MUS 205	Music Theory III	3
MUS 104	Ear Training II	1
MUS 106	Music Theory II	3
MUS 204	Ear Training IV	1
MUS 206	Music Theory IV	3
MUS 413	Form and Analysis	3

**History and Literature**

MUS 202	An Introduction to World Music, Jazz and Music Research	3
MUS 207	Music History and Literature: Antiquity through Baroque	3
MUS 302	Music History and Literature: Classic through Romantic	3
MUS 303	Music History and Literature: 20th Century Through the Present	3

One 400-level music history course	3
<b>Techniques</b>	
MUS 273 Introduction to Music Technology	1
MUS 325 Beginning Conducting	1
MUS 326 Instrumental Conducting	3
or MUS 327 Choral Conducting	
MUS 386 Applied Music Pedagogy and Literature I	2
MUS 415 Orchestration	3
MUS 441 Supervised Studio Teaching	2
MUS 486 Applied Music Pedagogy and Literature II	2
<b>Performance</b>	
MUS 121 Concert and Recital Laboratory (take for eight semesters for a total of 4 credits)	4
MUS 230 Applied Music I	20
& MUS 330 and Applied Music II	
& MUS 430 and Applied Music III (Applied Music (Instrumental) must take for a total of 20 credits)	
MUS 340 Junior Recital	1
MUS 440 Senior Recital	1-2
Applied or Functional Piano	4
Instrumental Ensemble	12
<b>Second Language Requirement: (not required)</b>	
Total Credits	90-91

## Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Instrumental Performance, there is no second language requirement for the degree.

### Note:

- All Music Majors must take MUS 430 for a minimum of 2 semesters.
- Music Performance students must take MUS 440 (Senior Recital) for 2 credits.

## Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until the Proficiency is passed.

## Science Requirement

- Students must complete PHYS 120G Introduction to Acoustics.

## Concentration: Piano Performance Requirements - Basic Music and Performance

### Music Theory and Ear Training

MUS 103 Ear Training I	1
MUS 105 Music Theory I	3
MUS 203 Ear Training III	1
MUS 205 Music Theory III	3
MUS 104 Ear Training II	1
MUS 106 Music Theory II	3
MUS 204 Ear Training IV	1
MUS 206 Music Theory IV	3

MUS 413 Form and Analysis	3
<b>History and Literature</b>	
MUS 202 An Introduction to World Music, Jazz and Music Research	3
MUS 207 Music History and Literature: Antiquity through Baroque	3
MUS 302 Music History and Literature: Classic through Romantic	3
MUS 303 Music History and Literature: 20th Century Through the Present	3
One 400-level music history course	3
<b>Techniques</b>	
MUS 273 Introduction to Music Technology	1
MUS 325 Beginning Conducting	1
MUS 386 Applied Music Pedagogy and Literature I	2
MUS 486 Applied Music Pedagogy and Literature II	2
MUS 441 Supervised Studio Teaching	2
<b>Performance</b>	
MUS 121 Concert and Recital Laboratory (take eight semesters for a total of 4 credits)	4
MUS 164 Chamber Ensembles (take two semesters for a total of 2 credits)	2
MUS 230 Applied Music I	20
& MUS 330 and Applied Music II	
& MUS 430 and Applied Music III (Applied Music (Piano) must take for a total of 20 credits)	
MUS 340 Junior Recital	1
MUS 350 Chamber Music (take two semesters for a total of 2 credits)	2
MUS 417 Studio Accompanying (take two semesters for a total of 4 credits)	4
MUS 440 Senior Recital	1-2
Ensemble	4
Secondary Applied	4
Upper Level Music Electives	4
<b>Second Language Requirement: (not required)</b>	
Total Credits	88-89

## Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Piano Performance, there is no second language requirement for the degree.

### Note:

- All Music Majors must take MUS 430 for a minimum of 2 semesters.
- Music Performance students must take MUS 440 (Senior Recital) for 2 credits.

## Secondary Proficiency

- Students must pass Secondary Proficiency before presenting a Senior Recital.

## Science Requirement

- Students must complete PHYS 120G Introduction to Acoustics.

## Concentration: Vocal Performance Requirements - Basic Music and Performance

### Music Theory and Ear Training

MUS 103	Ear Training I	1
MUS 105	Music Theory I	3
MUS 203	Ear Training III	1
MUS 205	Music Theory III	3
MUS 104	Ear Training II	1
MUS 106	Music Theory II	3
MUS 204	Ear Training IV	1
MUS 206	Music Theory IV	3
MUS 413	Form and Analysis	3

### History and Literature

MUS 202	An Introduction to World Music, Jazz and Music Research	3
MUS 207	Music History and Literature: Antiquity through Baroque	3
MUS 302	Music History and Literature: Classic through Romantic	3
MUS 303	Music History and Literature: 20th Century Through the Present	3
MUS 429	Opera and Music Drama	3

### Techniques

MUS 262	Diction I	2
MUS 263	Diction II	2
MUS 273	Introduction to Music Technology	1
MUS 325	Beginning Conducting	1
MUS 386 or MUS 486	Applied Music Pedagogy and Literature I Applied Music Pedagogy and Literature II	2
MUS 441	Supervised Studio Teaching	2

### Performance

MUS 121	Concert and Recital Laboratory (take for eight semesters for a total of 4 credits)	4
MUS 230 & MUS 330 & MUS 430	Applied Music I and Applied Music II and Applied Music III (Applied Music (vocal) must take for a total of 19 credits)	19
MUS 340	Junior Recital	1
MUS 440	Senior Recital	1-2
Choral Ensembles		6
Opera Ensembles		6
Applied or Functional Piano		4

### Second Language Requirement: (required - see below)

Total Credits	85-86
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## Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Vocal Performance the student must do the following:

FREN 111 & GER 111	Elementary French I and Elementary German I	8
or a high school equivalent		

### Note:

- All Music Majors must take MUS 430 for a minimum of 2 semesters.
- Music Performance students must take MUS 440 (Senior Recital) for 2 credits.

### Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until the Proficiency is passed.

### Science Requirement

- Student must complete PHYS 120G Introduction to Acoustics.

## Music Education - Bachelor of Music Education

The Bachelor of Music Education (BME) is a diversified four- to five-year degree program of teaching, performance, and specialized studies in music. The goal of this degree is to prepare the student for certification to teach music in the public schools, and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., M.M.E., D.M.A. or Ph.D in music education.

## Concentration: K-12 – Instrumental Requirements: Basic Music and Performance

### Music Theory and Ear Training

MUS 103	Ear Training I	1
MUS 104	Ear Training II	1
MUS 203	Ear Training III	1
MUS 204	Ear Training IV	1
MUS 105	Music Theory I	3
MUS 106	Music Theory II	3
MUS 205	Music Theory III	3
MUS 206	Music Theory IV	3
MUS 413	Form and Analysis	3

### History and Literature

MUS 202	An Introduction to World Music, Jazz and Music Research	3
MUS 207	Music History and Literature: Antiquity through Baroque	3
MUS 302	Music History and Literature: Classic through Romantic	3
MUS 303	Music History and Literature: 20th Century Through the Present	3

### Techniques

MUS 141	Class Voice I	1
MUS 273	Introduction to Music Technology	1
MUS 301	Marching Band Techniques	2
MUS 322	Guitar Methods	1
MUS 325	Beginning Conducting	1
MUS 326	Instrumental Conducting	3
MUS 415	Orchestration	3

Select five from the following: 5

MUS 315	Brass Techniques I	
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MUS 316	Brass Techniques II	
MUS 317	Woodwind Techniques I	
MUS 318	Woodwind Techniques II	
MUS 319	String Techniques I	
MUS 320	String Technique II	
MUS 323	Percussion Technique I	
MUS 324	Percussion Technique II	
MUS 390 or MUS 391	Survey of Wind Literature Survey of Orchestral Literature	2
<b>Performance</b>		
MUS 121	Concert and Recital Laboratory (take seven semesters for a total of 3.5 credits)	3.5
MUS 163	Jazz Ensembles	1
MUS 172	Marching Band (take two semesters for a total of 2 credits)	2
MUS 230 & MUS 330 & MUS 430	Applied Music I and Applied Music II and Applied Music III (Applied Music (Instrumental) must take for a total of 9 credits) <sup>1</sup>	9
MUS 440	Senior Recital	1-2
Instrumental Ensemble		4
<b>Professional Education Courses</b>		
C EP 210	Educational Psychology	3
EDUC 471	Secondary Student Teaching	9
EDUC 482	Middle and High School Student Teaching Seminar	3
MUS 250	Introduction to Music Education	2
MUS 346	Elementary Music Methods	2
MUS 349	Secondary Music Methods	2
RDG 414	Content Area Literacy	3
SPED 350	Introduction to Special Education in a Diverse Society	3
<b>Second Language Requirement: (not required)</b>		
Total Credits		97.5-98.5

<sup>1</sup> String students may substitute MUS 151 Philharmonic Orchestra, MUS 164 Chamber Ensembles, MUS 350 Chamber Music or MUS 362 Philharmonic Orchestra II for **MUS 172** Marching Band.

## Second Language Requirement

For the Bachelor of Music Education in Music Education with a Concentration in K-12: Instrumental, there is no second language requirement for the degree.

### Note:

- All Music Majors must take 2 semesters of MUS 430

## Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until Proficiency is passed.

## Music Education Requirement

- Students must pass the TEP Exam before taking MUS 346 Elementary Music Methods or MUS 349 Secondary Music Methods.
- Students must present Senior Recital before student teaching.

## Science Requirement

- Students must complete PHYS 120G Introduction to Acoustics.

## Concentration: K-12 – Vocal

### Requirements: Basic Music and Performance

#### Music Theory and Ear Training

MUS 103	Ear Training I	1
MUS 104	Ear Training II	1
MUS 203	Ear Training III	1
MUS 204	Ear Training IV	1
MUS 105	Music Theory I	3
MUS 106	Music Theory II	3
MUS 205	Music Theory III	3
MUS 206	Music Theory IV	3
MUS 413	Form and Analysis	3

#### History and Literature

MUS 202	An Introduction to World Music, Jazz and Music Research	3
MUS 207	Music History and Literature: Antiquity through Baroque	3
MUS 302	Music History and Literature: Classic through Romantic	3
MUS 303	Music History and Literature: 20th Century Through the Present	3

#### Techniques

MUS 262	Diction I	2
MUS 263	Diction II	2
MUS 273	Introduction to Music Technology	1
MUS 321	Instrumental Techniques for Vocal Music Education Majors	2
MUS 322	Guitar Methods	1
MUS 325	Beginning Conducting	1
MUS 327	Choral Conducting	3
MUS 386	Applied Music Pedagogy and Literature I	2
MUS 392	Survey of Choral Literature	2
MUS 415	Orchestration	3

#### Performance

MUS 121	Concert and Recital Laboratory (take seven semesters for a total of 3.5 credits)	3.5
MUS 230 & MUS 330 & MUS 430	Applied Music I and Applied Music II and Applied Music III (Applied Music (vocal) must take for a total of 9 credits)	9
MUS 440	Senior Recital	1-2
Vocal Ensemble		7
<b>Professional Education Courses</b>		
C EP 210	Educational Psychology	3

EDUC 471	Secondary Student Teaching	9
EDUC 482	Middle and High School Student Teaching Seminar	3
MUS 250	Introduction to Music Education	2
MUS 346	Elementary Music Methods	2
MUS 349	Secondary Music Methods	2
RDG 414	Content Area Literacy	3
SPED 350	Introduction to Special Education in a Diverse Society	3
<b>Second Language Requirement: (not required)</b>		
Total Credits		97.5-98.5

## Second Language Requirement

For the Bachelor of Music Education in Music Education with a Concentration in K-12: Vocal, there is no second language requirement for the degree.

### Note:

- All Music Majors must take 2 semesters of MUS 430

## Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until Proficiency is passed.

## Music Education Requirement

- Students must pass the TEP Exam before taking MUS 346 Elementary Music Methods or MUS 349 Secondary Music Methods.
- Students must present Senior Recital before student teaching.

## Science Requirement

- Students must complete PHYS 120G Introduction to Acoustics.

# Music - Undergraduate Minor

A student may not earn both a bachelor's degree in the Department of Music and a minor in Music.

### Required Courses

MUS 202	An Introduction to World Music, Jazz and Music Research	3
MUS 103	Ear Training I	1
MUS 105	Music Theory I	3
MUS 104	Ear Training II	1
MUS 106	Music Theory II	3
Upper division elective credits		9
Applied music		2
Ensemble		2
Total Credits		24

# Music - Master of Music

## Area of Study: Conducting

### Required Courses

MUS 471	Graduate Theory Review <sup>1</sup>	3
MUS 477	Graduate Music History Review <sup>1</sup>	3

MUS 527	History and Analysis of the Symphony	3
Music Theory		3
Music History and Literature		3
Conducting		9
MUS 450	Research Methods	3
MUS 580	Ensemble Performance	1
MUS 540	Graduate Recital/Analytical Paper	4
Total Credits		32

- <sup>1</sup> Students must make a B or better before taking additional music theory/music history courses.

### Choral Conducting Requirement:

- Choral Conducting students will substitute a Choral Literature course for MUS 527.

## Area of Study: Music Education

### Requirements

Students must make the grade of B or better in a course for it to count toward degree completion.

### Required Courses

MUS 471	Graduate Theory Review <sup>2</sup>	3
MUS 477	Graduate Music History Review <sup>2</sup>	3
Music Theory		3
Music History and Literature		3
Music Education		9
Approved Elective		3
MUS 450	Research Methods	3
MUS 598	Special Research Programs	4
or MUS 599		Master's Thesis
Total Credits		31

- <sup>2</sup> Students must make a B or better before taking additional music theory/music history courses.

## Area of Study: Performance

### Requirements

MUS 471	Graduate Theory Review <sup>3</sup>	3
MUS 477	Graduate Music History Review <sup>3</sup>	3
Music Theory		3
Music History and Literature		3
Applied		8
Pedagogy and Literature		4
MUS 450	Research Methods	3
MUS 580	Ensemble Performance	1
MUS 540	Graduate Recital/Analytical Paper	4
Total Credits		32

- <sup>3</sup> Students must make a B or better before taking additional music theory/music history courses.

# Philosophy

## Undergraduate Program Information

A major in philosophy serves not only as preparation for further graduate study in philosophy but also as an area of concentration in a liberal arts program. A philosophy major is appropriate for students planning to attend medical school as well as for those students interested in a career that requires critical reading and argument analysis. Such careers include business, theology and above all, law.

While the course requirements for the major should meet the ends of the liberal arts student, those students interested in graduate study in philosophy or in a career in law are encouraged to seek advice from a faculty advisor as early in their career as possible.

A minor program in philosophy requiring 18 hours of course work is also offered as well as a minor in Ethics. For more information visit the Department of Philosophy's web page at [www.nmsu.edu/](http://www.nmsu.edu/~philos/) (<http://www.nmsu.edu/~philos/~philos/>).

## Degrees for the Department

Philosophy - Bachelor of Arts (p. 398)

## Minors for the Department

Ethics - Undergraduate Minor (p. 398)

Philosophy - Undergraduate Minor (p. 398)

**Timothy Cleveland, Department Head**

**Professors** Cleveland, Walker; **Associate Professors** Keleher, Vessel; **Assistant Professor** Klockseim; **College Associate Professor** Noonan

## Philosophy Courses

### PHIL 100G. Philosophy, Law and Ethics

#### 3 Credits

An introduction to practical problems in moral, social, political, and legal philosophy. Topics to be discussed may include ecology, animal rights, pornography, hate speech on campus, same-sex marriage, justice, abortion, terrorism, treatment of illegal immigrants, and New Mexican Aboriginal Peoples' land claims.

### PHIL 101G. The Art of Wondering

#### 3 Credits

Introduction to some of the main problems of philosophy, with an emphasis on critical thinking. Philosophy conceived as an aid to living in this world with oneself and with others.

### PHIL 124G. Philosophy of Music

#### 3 Credits

This is an introductory course in the philosophy of music. This course will survey three questions: What is music? Why is music important? How can we distinguish good music from bad music? We will draw examples from a wide variety of musical genres, from classical music, jazz and blues to punk and rap. Students will be encouraged to apply philosophical theorizing to think about their preferred musical form.

### PHIL 136G. The Quest for God

#### 3 Credits

An effort to understand the religious life; a consideration of some of the traditional approaches to God and what it means to be religious.

### PHIL 201G. Introduction to Philosophy

#### 3 Credits

Selected problems within the main branches of philosophy: metaphysics, theory of knowledge, ethics. Practice given in critical thinking.

### PHIL 211G. Informal Logic

#### 3 Credits

Logical analysis of ordinary language, construction of definitions, argumentation, analysis of fallacious modes of thought and basic rhetorical considerations.

### PHIL 223G. Ethics

#### 3 Credits

The philosophical explication of morality. Significant ethical systems developed in the history of Western thought.

### PHIL 305. Philosophy and Literature

#### 3 Credits

Examination of philosophical ideas as presented in selected literary works and literary criticism.

### PHIL 306. Philosophy Through Film

#### 3 Credits

An exploration of a range of philosophical issues through the use of film. Topics include personal identity and memory, faith and the problem of evil, free will and moral responsibility, and the meaning of life. Films may include *The Prestige*, *Memento*, *The Third Man*, *A Clockwork Orange*, *Fight Club*, and *Synecdoche, New York*.

### PHIL 312. Formal Logic

#### 3 Credits

Introduction to symbolic logic and its application in the analysis of arguments in scientific and ordinary discourse.

### PHIL 315. Philosophy of Language

#### 3 Credits

A critical examination of philosophical inquiries into the syntactic, semantic, and pragmatic dimensions of language.

### PHIL 316. Philosophy of Mathematics

#### 3 Credits

Survey of traditional philosophical problems and views concerning the nature of mathematics including such questions as: What is the nature of mathematical knowledge? What is mathematical truth? What is a number? What is proof? What is the relationship between logic and mathematics?

### PHIL 320. Social and Political Philosophy

#### 3 Credits

This course critically examines such fundamental concepts as liberty, equality and human rights.

### PHIL 321. Biomedical Ethics

#### 3 Credits

Examines ethical dimensions of such issues as abortion, euthanasia, and physician-assisted suicide; informed consent as a condition of treating patients and experimenting on subjects; genetic engineering; and alternative reproductive methods, including surrogate motherhood. Also considers what implications moral theories have for these issues.

### PHIL 322. Environmental Ethics

#### 3 Credits

Explores the ethical and topical issues raised by mining and grazing, air and water pollution, factory farming, global warming, and treatment of animals. It also studies some recent ecological movements such as ecofeminism, social ecology, and deep ecology.

**PHIL 323V. Engineering Ethics****3 Credits**

The moral legal responsibilities of engineers to clients, employers, the public, and the environment. Topics include criteria for judging when risk is acceptable, the duty to safeguard public health and welfare, conflicts of interest, and whistle-blowing.

**Prerequisite:** Junior standing or higher.

**PHIL 327. Ethics and Sports****3 Credits**

Examines contemporary ethical issues related to sports, including the relationship between morally right action and that required for competitive success, strong paternalism in sports, fair play, doping, sportsmanship, and the impact of sports on society.

**PHIL 328. Applied Ethics****3 Credits**

Examines the implications of utilitarianism, Kantian ethics, natural law theory, and other moral theories for controversial moral issues such as the death penalty, euthanasia, abortion, genetic engineering, gay marriage, affirmative action, and pornography.

**PHIL 330. Ethics and Biomedical Research****3 Credits**

Explores some ethical issues raised by biological and biomedical research. Topics include: possible abuses of genetic engineering, cloning, and genetically modified foods; experimentation on humans and informed consent; animal experimentation; honesty in research and conflicts of interest; and intellectual property.

**PHIL 331. Philosophy of Religion****3 Credits**

The nature, fundamental concepts, and problems of religion. Emphasis on the significance of religion for creative and practical value.

**PHIL 332. Ethics and Global Poverty****3 Credits**

Philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

**PHIL 341. Ancient Philosophy****3 Credits**

Introduction to the philosophies of the pre-Socratics, Socrates, Plato, Aristotle, with brief discussion of the Epicureans and Stoics.

**PHIL 344. Modern Philosophy****3 Credits**

Foundations of contemporary thought: introduction to the philosophies of Descartes, Bacon, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and Hegel.

**PHIL 346. Philosophy of Mind****3 Credits**

Examination of some of the most influential accounts of the mind, focusing on such issues as the relation between the mind and the body, mental causation and consciousness.

**PHIL 350. Epistemology****3 Credits**

Introduction to epistemology. The philosophical critique of alleged ways of knowing. An examination of the nature of truth.

**PHIL 351. Philosophy of Science****3 Credits**

Philosophical examination of the methodology of science. The logical, metaphysical, epistemological, and ethical critique of science and its impact on human affairs.

**PHIL 361. Special Topics****3 Credits**

Specific subjects announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

**PHIL 363. Independent Studies****1-3 Credits**

For students with some background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHIL 373. Ethical Theory****3 Credits**

The critical examination of the justification of ethical theories with particular attention to the language of moral discourse.

**PHIL 376. Philosophy of Law****3 Credits**

Ethical, logical, and epistemological implications of law, together with an analysis of the rhetoric of legal practice.

**PHIL 380. Metaphysics****3 Credits**

Introduction to metaphysics: a treatment of such issues as the meaning of existence, the mind-body problem, the problem of universals, and free will versus determinism.

**PHIL 385. Human Nature and the Good Life****3 Credits**

An examination of some of the most historically and philosophically influential conceptions of human nature and corresponding accounts of the good life.

**PHIL 397. Existentialism****3 Credits**

The origins of existentialist thought in philosophy and literature, including the thought of Nietzsche, Kierkegaard, Dostoyevsky, Camus, and Sartre. The course covers topics in ethics and political philosophy, metaphysics, philosophical psychology, philosophy of religion, and other sub-disciplines of philosophy.

**PHIL 413. Modal Logic****3 Credits**

A formal introduction to the logic of necessity, possibility, and impossibility: the syntactic and semantic aspects of the formal modal systems T, S4, S5, as well as their philosophical implications.

**PHIL 448. Writing Philosophy****3 Credits**

A workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes.

**Prerequisite(s):** completed 18 hours of philosophy credit.

**PHIL 463. Independent Studies****1-3 Credits**

For students with a strong background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHIL 505. Advanced Studies in Philosophy and Literature****3 Credits**

Examination of philosophical issues (e.g. personal identity, free will, moral dilemmas, the meaning of life) as presented in selected literary works and literary criticism. Consent of Instructor required.

**PHIL 532. Advance Studies in Ethics and Global Poverty****3 Credits**

Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

**Phone:** (575) 646-4616

**Website:** <http://www.nmsu.edu/~philos/>

## Philosophy - Bachelor of Arts

**General Education Requirements**<sup>1</sup> 35

**Viewing a Wider World Requirement**<sup>1</sup> 6

### Departmental Requirements

#### *Introductory Philosophy*

PHIL 101G The Art of Wondering 3  
or PHIL 201G Introduction to Philosophy

#### *Ethics*

Select one from the following: 3  
PHIL 320 Social and Political Philosophy  
PHIL 373 Ethical Theory  
PHIL 376 Philosophy of Law

#### *Logic*

PHIL 211G Informal Logic 3  
or PHIL 312 Formal Logic

#### *History of Philosophy*

Select one from the following: 3  
HON 227G Plato and the Discovery of Philosophy  
PHIL 341 Ancient Philosophy  
PHIL 344 Modern Philosophy

#### *Applied Ethics*

Select one from the following: 3  
PHIL 321 Biomedical Ethics  
PHIL 322 Environmental Ethics  
PHIL 323V Engineering Ethics  
PHIL 327 Ethics and Sports  
PHIL 328 Applied Ethics  
PHIL 330 Ethics and Biomedical Research  
PHIL 332 Ethics and Global Poverty

Select two from the following: 6

PHIL 315 Philosophy of Language  
PHIL 316 Philosophy of Mathematics  
PHIL 346 Philosophy of Mind  
PHIL 350 Epistemology  
PHIL 351 Philosophy of Science  
PHIL 380 Metaphysics

#### *Philosophical Writing*

PHIL 448 Writing Philosophy 3

#### **Additional Requirements**

Select at least an additional 12 credits in philosophy, 6 of which are courses numbered 300 or above or the following HON courses: 12

#### **Electives**

Select sufficient electives to bring total to 120, including 48 upper-division.<sup>2</sup> 43

#### **Second Language Requirement: (not required)**

Total Credits 120

<sup>1</sup> For more information about General Education Courses, please see the General Education Courses (p. 46) section of the catalog.

<sup>2</sup> HON 227G and HON 228G will also satisfy this requirement.

### Second Language Requirement

For the Bachelor of Arts in Philosophy there is no second language requirement.

## Ethics - Undergraduate Minor

A student who earns a Bachelor of Arts in Philosophy may not also earn a minor in Ethics.

#### **Required Courses**

PHIL 101G The Art of Wondering 3  
or PHIL 201G Introduction to Philosophy  
PHIL 211G Informal Logic 3  
or PHIL 312 Formal Logic  
PHIL 373 Ethical Theory 3

Select three from the following, of which at least two must be upper division:<sup>1</sup> 9

C J 425 Issues in Ethics, Law, and Criminal Justice  
HON 304V Dilemmas of War and Peace  
HON 306V Science, Ethics and Society  
JOUR 377V Mass Media Ethics  
PHIL 321 Biomedical Ethics  
PHIL 322 Environmental Ethics  
PHIL 323V Engineering Ethics  
PHIL 327 Ethics and Sports  
PHIL 328 Applied Ethics  
PHIL 330 Ethics and Biomedical Research  
PHIL 332 Ethics and Global Poverty  
SUR 401 Ethics and Professionalism in Surveying and Mapping

Total Credits 18

<sup>1</sup> Students may earn up to 3 credits in this category from special topics or Honors courses approved by the head of the Department of Philosophy.

## Philosophy - Undergraduate Minor

A student who earns a Bachelor of Arts in Philosophy may not also earn a minor in Philosophy.

**Required Courses**

PHIL 101G	The Art of Wondering	3
or PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	3
or PHIL 312	Formal Logic	
Select one from the following:		3
PHIL 223G	Ethics	
PHIL 328	Applied Ethics	
PHIL 373	Ethical Theory	
Select 9 credits from Philosophy at the 300 or above level		9
Total Credits		18

## Physics

### Undergraduate Program Information

A bachelor's degree in physics provides the basis for careers in industry, teaching, the military, government or for study toward advanced degrees in physics or engineering. It should also provide the skills that recipients of physics degrees have listed as among the most important in obtaining their current positions, including problem solving ability, computer skills, mathematical skills, and laboratory skills, as well as knowledge of physics.

Further information about the department may be found on the web at [www.physics.nmsu.edu](http://www.physics.nmsu.edu) (<http://www.physics.nmsu.edu>). All incoming (new or transfer) students must schedule an orientation meeting with the department head and/or the undergraduate program head before their first semester at NMSU. All students will be assigned a faculty advisor in the physics department to discuss course selection, career resources, internships and coops, and other topics.

### Graduate Program Information

The Department of Physics offers programs in many areas of emphasis leading to the MS and Ph.D. degrees. Admission to these programs is competitive and selection of applicants is based on undergraduate and/or previous graduate grade-point averages, performance on the general and subject Graduate Record Examination, other evidence of prior academic and research accomplishments submitted by the applicant, and references, as well as, in the case of applicants for the doctoral program, matching of the applicant's research interests, as described by the student's statement of purpose, to the Department's research activities.

All degree-seeking graduate students must satisfy the relevant Graduate School requirements, pass a qualifying examination based on undergraduate physics courses at the 400 level, successfully complete a 3-credit, 500-level laboratory, and demonstrate or develop knowledge of computer programming. Additional course requirements are described below; courses taken S/U may not be used to satisfy any of the degree requirements, including the lab requirement for Master's and Ph.D. students.

The qualifying and comprehensive examination outcomes are decided by vote of the entire faculty, based on the recommendations of the corresponding examination committees. For the qualifying examination, the faculty may decide that

- a student pass at the doctoral level;
- pass at the master's level;
- be requested to retake the exam at the next available opportunity; or
- terminate graduate study.

For the written part of the comprehensive examination, the faculty may decide that

- a student be given an unconditional pass;
- be given a conditional pass, with the requirement that the student produce additional evidence of research accomplishments during the oral part of the exam before being granted admission to candidacy;
- repeat the written part the next time it is offered; or
- terminate graduate study.

In addition, the faculty may decide to discontinue financial support to a student based on the student's performance on the qualifying or comprehensive examination. Students will receive written notification of the exam's outcome from the Graduate Physics Program Head within 30 days of the exam. Appeals must be addressed to the Physics Department Head within 30 days of receiving written notification of the exam's outcome and will be decided by the physics faculty.

A student granted an unconditional or conditional pass on the written part of the comprehensive examination must take the oral part in the same semester that the written part was taken; the student's Ph.D. committee makes the final decision, following the oral part of the comprehensive examination, on admission of the student to the candidacy to the doctoral degree.

Students may choose areas of emphasis from a variety of experimental, theoretical and computational research programs in the department. The current major research areas of the department include atmospheric physics, condensed matter physics/materials science, geophysics, optics, particle and nuclear physics, physics education, and others. These research projects are supported by multimillion-dollar funding by various federal agencies and two national laboratories within the state of New Mexico: Los Alamos National Laboratory and Sandia National Laboratories. In addition to the in-house research, the department conducts collaborative research programs with

- The Brookhaven National Laboratory,
- The Center for Integrated NanoTechnologies,
- Los Alamos National Laboratory,
- Sandia National Laboratories,
- The Thomas Jefferson Laboratory,
- Fermilab,
- Air Force Research Laboratory and
- other national and international laboratories.

The MS in Physics with a concentration in Space Physics program provides students with a strong foundation in physics with an intensive focus on space physics. Graduate study in space physics at the master's level prepares graduates for continued and specialized study toward the doctorate program in space-related fields as well as for challenges they will confront in space industrial and government settings.

The department is housed in a newly-renovated building which contains research laboratories, classrooms, offices and a computational laboratory.

## Degrees for the Department

Physics - Bachelor of Arts (p. 405)

Physics - Bachelor of Science (p. 407)

Engineering Physics - Bachelor of Science in Engineering Physics (p. 405)

Physics - Master of Science (p. 409)

Physics - Doctor of Philosophy (p. 409)

### Dual Degree

Physics-Bachelor of Science/Master of Science (p. 407) (scroll to bottom of the B.S. Page for more information)

## Minors for the Department

Physics - Undergraduate Minor (p. 408)

Physics - Graduate Minor (p. 410)

**Professor, Stefan Zollner, Department Head**

**Professor, Stephen Pate, Undergraduate Program Head**

**Associate Professor, Vassilios Papavassiliou, Graduate Program Head**

**Professor, Heinz Nakotte, Engineering Physics Program Head**

**Professors** Ma. Burkardt, Kiefer, Nakotte, Pate, Vasiliev, Zollner; **Associate Professors** Engelhardt, Hearn, Papavassiliou, Urquidi; **Assistant Professors** Cooper, Fohtung, Schlegel, Waszek; **College Professors** Mi. Burkardt, DeAntonio; **Emeritus Faculty** Burleson, Gibbs, Goedecke, Kanim, Kyle, Liefeld, Ni.

**Graduate Faculty** S. Zollner, Department Head, Ph.D. (Stuttgart)– *experimental condensed matter and applied physics*; V. Papavassiliou, Graduate Program Head, Ph.D. (Yale)– *nuclear and particle physics*; C. W. Bruce, Ph.D. (New Mexico State)– *applied optics*; M. Burkardt, Ph.D. (Erlangen)– *theoretical nuclear and particle physics*; R. Cooper, Ph.D. (Michigan)– *nuclear and particle physics*; M. DeAntonio, Ph.D. (New Mexico State)– *applied optics*; M. Engelhardt, Ph.D. (Erlangen)– *computational nuclear and particle physics*; E. Fohtung, Ph.D. (Freiburg)– *materials science, neutron and X-ray scattering*; G. H. Goedecke, Ph.D. (Rensselaer)– *theoretical physics, optics*; T. M. Hearn, Ph.D. (Cal Tech)– *seismic tomography, seismology*; S. Kanim, Ph.D. (University of Washington)– *Physics Education*; B. Kiefer, Ph.D. (Michigan)– *computational condensed matter physics, mineral physics*; H. Nakotte, Ph.D. (Amsterdam)– *materials science, neutron scattering*; J. Ni, Ph.D. (Cornell)– *geophysics, seismology*; S. F. Pate, Ph.D. (Pennsylvania)– *nuclear and particle physics*; M. Schlegel, Ph.D. (Bochum)– *theoretical nuclear and particle physics*; J. Urquidi, Ph.D. (Texas Tech)– *materials science, neutron and X-ray scattering*; I. Vasiliev, Ph.D. (Minnesota)– *computational materials science*; L. Waszek, Ph.D. (Cambridge)– *geophysics, seismology*.

## Geophysics Courses

**GPHY 340V. Planet Earth**  
**3 Credits**

Formation and evolution of the Earth. Plate tectonics, volcanoes and earthquakes. Role of geological processes in the origin and evolution of life. Uniqueness of the Earth in the solar system.

**GPHY 450. Selected Topics**

**1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected areas of geophysics. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**GPHY 510. Geophysical Field Methods**

**1-3 Credits (3-9P)**

Field collection, reduction, and interpretation of geophysical data; equipment operation.

**GPHY 520. Selected Topics**

**1-3 Credits**

Formal treatment of graduate topics not covered in regular courses. May be repeated for unlimited credit.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.

**GPHY 530. Seismology**

**3 Credits**

Seismic wave propagation in a layered earth, ray theory, exploration techniques, earth structure, and seismicity. May be repeated up to 3 credits.

**Prerequisite(s):** PHYS 511 or consent of instructor.

**GPHY 540. Physics of the Earth and Planetary Interiors**

**3 Credits**

Formation and evolution of the Earth and planets. Internal physical and chemical structure. Pressure and temperature effects on rocks. Equations of state. Physical mechanisms of plate tectonics. Physics of the Earth's core, planetary magnetism, geodynamo.

**Prerequisites:** consent of instructor.

**GPHY 560. Applied Inverse Theory**

**3 Credits**

Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, over determined and under determined problems, linear and nonlinear problems. Computing experience desirable. May be repeated up to 3 credits. Consent of Instructor required.

**GPHY 598. Special Research Problems**

**1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for unlimited credit.

**GPHY 599. Master's Thesis**

**1-15 Credits (1-15)**

Thesis.

**GPHY 620. Advanced Topics in Geophysics**

**3 Credits**

Advanced formal treatment of a topic or topics not covered in regular courses. May be repeated for unlimited credit.

**Prerequisite:** consent of instructor.

**GPHY 630. Theoretical Seismology I**

**3 Credits**

Advanced treatment of wave propagation, ray theory, inversion methods, extension to heterogeneous media, and free oscillations.

**Prerequisite(s):** GPHY 530.

**GPHY 700. Doctoral Dissertation**

**1-15 Credits (1-15)**

Dissertation.

## Physics Courses

### PHYS 110G. The Great Ideas of Physics

#### 4 Credits (3+3P)

Conceptual, quantitative, and laboratory treatments of the great ideas and discoveries that have influenced lives and changed perceptions of nature, from Johannes Kepler's laws of planetary motion and Isaac Newton's and Albert Einstein's laws of motion and gravity to the modern concepts of the quantal structure of nature and the big bang universe.

### PHYS 120G. Introduction to Acoustics

#### 4 Credits (3+2P)

Lecture, demonstration, and laboratory treatment of the general properties of waves, the production, transmission, and reception of sound waves, including musical and vocal sounds, and characteristics of the human ear and several kinds of sources.

### PHYS 150. Elementary Computational Physics

#### 3 Credits (2+2P)

Introduction to computational techniques for the solution of physics-related problems. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 121G or MATH 190G or MATH 191G.

### PHYS 203. Supplemental Instruction to PHYS 213

#### 0.5-1 Credits (.5-1)

Optional workshop as a supplement to PHYS 213. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 213.

### PHYS 204. Supplemental Instruction to PHYS 214

#### 0.5-1 Credits (.5-1)

Optional workshop as a supplement to PHYS 214. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 214.

### PHYS 205. Supplemental Instruction to PHYS 215G

#### 0.5-1 Credits (.5-1)

Optional workshop as a supplement to PHYS 215G. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 215G.

### PHYS 206. Supplemental Instruction to PHYS 216G

#### 0.5-1 Credits (.5-1)

Optional workshop as a supplement to PHYS 216G. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 216G.

### PHYS 210. Introductory Physics for the Health Sciences

#### 3 Credits

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

**Prerequisite(s):** MATH 120 or Equivalent.

### PHYS 211G. General Physics I

#### 3 Credits

Non-calculus treatment of mechanics, waves, sound, and heat.

Knowledge of simple algebra and trigonometry is required.

### PHYS 211GL. General Physics I Laboratory

#### 1 Credit

Laboratory experiments in topics associated with material presented in PHYS 211G.

**Prerequisite(s)/Corequisite(s):** PHYS 211G.

### PHYS 212G. General Physics II

#### 3 Credits

Non-calculus treatment of electricity, magnetism, and light. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 211G or PHYS 221G.

### PHYS 212GL. General Physics II Laboratory

#### 1 Credit

Laboratory experiments in topics associated with material presented in PHYS 212G.

**Prerequisite(s)/Corequisite(s):** PHYS 212G.

### PHYS 213. Mechanics

#### 3 Credits

Newtonian mechanics. Pre/

**Corequisite(s):** MATH 191G.

### PHYS 213 L. Experimental Mechanics

#### 1 Credit

Laboratory experiments associated with the material presented in PHYS 213. Science majors. Pre/

**Corequisite(s):** PHYS 213.

### PHYS 214. Electricity and Magnetism

#### 3 Credits

Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 192G. Prerequisite(s): a C- or better in PHYS 213 or PHYS 215G, and MATH 191G.

### PHYS 214 L. Electricity and Magnetism Laboratory

#### 1 Credit

Laboratory experiments associated with the material presented in PHYS 214.

**Prerequisite(s)/Corequisite(s):** PHYS 214. Prerequisite(s): a C- or better in PHYS 213L or PHYS 215GL.

### PHYS 215G. Engineering Physics I

#### 3 Credits

Calculus-level treatment of kinematics, work and energy, particle dynamics, conservation principles, simple harmonic motion. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 191G.

### PHYS 215GL. Engineering Physics I Laboratory

#### 1 Credit

Laboratory experiments associated with the material presented in PHYS 215G. Students wishing to use the PHYS 215G-216G sequence to satisfy the basic natural science general education requirement must register for either PHYS 215GL or PHYS 216GL. Pre/

**Corequisite(s):** PHYS 215G.

### PHYS 216G. Engineering Physics II

#### 3 Credits

A calculus-level treatment of topics in electricity, magnetism, and optics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 213 or PHYS 215G and MATH 192G.

**PHYS 216GL. Engineering Physics II Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 216G.

**Prerequisite(s)/Corequisite(s):** PHYS 216G. Prerequisite(s): A C- or better in PHYS 213L or PHYS 215GL.

**PHYS 217. Heat, Light, and Sound****3 Credits**

Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 213 or PHYS 215G, and MATH 191G.

**PHYS 217 L. Experimental Heat, Light and Sound****1 Credit**

Laboratory experiments associated with the material presented in PHYS 217. Science majors.

**Prerequisite(s)/Corequisite(s):** PHYS 217. Prerequisite(s): a C- or better in PHYS 213L or PHYS 215GL.

**PHYS 218. Supplemental Instruction to PHYS 217****0.5-1 Credits (.5-1)**

This optional workshop supplements PHYS 217 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 217 to problem solving and quantitative analysis. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 217.

**PHYS 221G. General Physics for Life Sciences I****3 Credits**

This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

**Prerequisites:** a C or better in MATH 120 or higher.

**PHYS 221GL. Laboratory to General Physics for Life Science I****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 221G.

**Prerequisite(s)/Corequisite(s):** PHYS 221G. Restricted to Las Cruces campus only.

**PHYS 222G. General Physics for Life Sciences II****3 Credits**

This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 211G or PHYS 221G, and MATH 121G.

**PHYS 222GL. Laboratory to General Physics for Life Sciences II****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 222G.

**Prerequisite(s)/Corequisite(s):** PHYS 222G. Restricted to Las Cruces campus only.

**PHYS 223. Supplemental Instruction to PHYS 221****1 Credit**

This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.

**Corequisite(s):** PHYS 221G.

**PHYS 224. Supplemental Instruction to PHYS 222****1 Credit**

This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving.

**Corequisite(s):** PHYS 222G.

**PHYS 280. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 290. Special Topics****1-3 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PHYS 303V. Energy and Society in the New Millennium****3 Credits**

Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

**PHYS 304. Forensic Physics****4 Credits (3+3P)**

Theories, laboratory, and field techniques in the area of forensic physics.

**PHYS 305V. The Search for Water in the Solar System****3 Credits**

Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.

**PHYS 315. Modern Physics****3 Credits**

An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 291G and PHYS 214 or PHYS 216G.

**PHYS 315 L. Experimental Modern Physics****3 Credits (1+6P)**

Elementary laboratory in modern physics which supports the subject matter in PHYS 315. Required for physics majors. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 315. Prerequisite(s): a C- or better in PHYS 214L or 216GL.

**PHYS 316. Supplemental Instructions to PHYS 315****1 Credit**

This optional workshop supplements PHYS 315 "Modern Physics".

Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.

**Corequisite(s):** PHYS 315.

**PHYS 350. Special Topics****1-3 Credits**

Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

**PHYS 380. Individual Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 395. Intermediate Mathematical Methods of Physics****3 Credits**

Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): a C- or better in MATH 291G.

**PHYS 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 420. Capstone Project I****3 Credits**

Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

**PHYS 421. Capstone Project II****3 Credits**

Continuation of PHYS 420.

**PHYS 450. Selected Topics****1-3 Credits**

Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

**PHYS 451. Intermediate Mechanics I****3 Credits**

Vector calculus, Lagrangian and Hamiltonian formulations of Newtonian mechanics. Topics include central force motion, dynamics of rockets and space vehicles, rigid body motion, noninertial reference frames, oscillating systems, relativistic mechanics, classical scattering, and fluid mechanics. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): a C- or better in PHYS 213 or PHYS 215G, and MATH 291G.

**PHYS 454. Intermediate Modern Physics I****3 Credits**

Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392 and PHYS 395. Prerequisite(s): a C- or better in PHYS 315.

**PHYS 455. Intermediate Modern Physics II****3 Credits**

Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 454, MATH 392, and PHYS 395.

**PHYS 461. Intermediate Electricity and Magnetism I****3 Credits**

The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392 and PHYS 395. Prerequisite(s): a C- or better in PHYS 214 or PHYS 216G or equivalent and a C- or better in MATH 291G.

**PHYS 462. Intermediate Electricity and Magnetism II****3 Credits**

Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 461, MATH 392, and PHYS 395.

**PHYS 467. Nanoscience and Nanotechnology****3 Credits**

See CHME 467. Crosslisted with: CHME 467. .

**Prerequisite(s):** CHEM 112 and (PHYS 211 or PHYS 215) and (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard.

**PHYS 468. Intermediate X-ray Diffraction****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: CHME 488.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 471. Modern Experimental Optics****3 Credits (1+6P)**

Advanced laboratory experiments in optics related to the material presented in PHYS 473.

**Prerequisite(s):** PHYS 315 and PHYS 315L.

**PHYS 473. Introduction to Optics****4 Credits**

The nature of light, Geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. May be repeated up to 4 credits. Crosslisted with: E E 473.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**PHYS 475. Advanced Physics Laboratory****1-3 Credits (1+6P)**

Advanced undergraduate laboratory involving experiments in atomic, molecular, nuclear, and condensed-matter physics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 476. Computational Physics****3 Credits**

An introduction to finite difference methods, Fourier expansions, Fourier integrals, solution of differential equations, Monte Carlo calculations, and application to advanced physics problems. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 150 or equivalent and MATH 392.

**PHYS 478. Fundamentals of Photonics****4 Credits (3+3P)**

See E E 478. Crosslisted with: E E478.

**Prerequisite(s):** PHYS 216G or PHYS 217.**PHYS 479. Lasers and Applications****4 Credits (3+3P)**

See E E479 Crosslisted with: E E479.

**Prerequisite(s):** C- or better in E E 315 or PHYS 461.**PHYS 480. Thermodynamics****3 Credits**

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 217, PHYS 315, and MATH 291G.**PHYS 485. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.**PHYS 488. Introduction to Condensed Matter Physics****3 Credits**

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315.**PHYS 489. Introduction to Modern Materials****3 Credits**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315.**PHYS 491. High Energy Physics I****3 Credits**

Particle detectors, accelerators, and experimental techniques. Fundamental particles and interactions. Symmetries in particle physics. Quark model of hadrons. Electroweak theory. Strong interactions and QCD. Nuclear interactions at high energies. Grand unification. Super symmetry. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 455.**PHYS 493. Experimental Nuclear Physics****3 Credits (1+6P)**

Selected experimental investigations in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.**PHYS 495. Mathematical Methods of Physics I****3 Credits**

Applications of mathematics to experimental and theoretical physics. Topics selected from: complex variables; special functions; numerical analysis; Fourier series and transforms, Laplace transforms. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 392 and PHYS 395.**PHYS 500. Special Topics Seminar****1-2 Credits**

Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

**PHYS 511. Mathematical Methods of Physics I****3 Credits**

Same as PHYS 495. Additional work required at a more advanced level.

**PHYS 520. Selected Topics****1-3 Credits**

Formal treatment of graduate-level topics not covered in regular courses. May be repeated for a maximum of 9 credits.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.**PHYS 521. Individual Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.**PHYS 528. Fundamentals of Photonics****4 Credits (3+3P)**

Same as E E 528. Crosslisted with: E E528.

**PHYS 551. Classical Mechanics****3 Credits**

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

**PHYS 554. Quantum Mechanics I****3 Credits**

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

**PHYS 555. Quantum Mechanics II****3 Credits**

Continuation of topics in PHYS 554.

**Prerequisites:** PHYS 554 or consent of instructor.**PHYS 561. Electromagnetic Theory I****3 Credits**

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

**PHYS 562. Electromagnetic Theory II****3 Credits**

Continuation of topics in PHYS 561.

**Prerequisites:** PHYS 561 or consent of instructor.**PHYS 567. Nanoscience and Nanotechnology****3 Credits**

See CHME 567. Crosslisted with: CHME 567.

**PHYS 568. Elements of X-ray Diffraction****3 Credits**

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

**PHYS 571. Advanced Experimental Optics****3 Credits**

Taught with PHYS 471 with additional work required at the graduate level. Consent of Instructor required.

**Prerequisite(s):** PHYS 473 or PHYS 562.

**PHYS 575. Advanced Physics Laboratory****1-3 Credits (1+6P)**

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

**PHYS 576. Advanced Computational Physics I****3 Credits**

Advanced treatment of topics listed under PHYS 476, plus additional required work. Applications of numerical methods to complex physical systems. Recommended knowledge of Fortran or C, and MATH 377 or MATH 392. Same as PHYS 476, but additional work required.

**PHYS 577. Fourier Methods in Electro-Optics****3 Credits**

Same as E E 577 Crosslisted with: E E 577

**PHYS 584. Statistical Mechanics****3 Credits**

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

**PHYS 588. Condensed Matter Physics****3 Credits**

Same as PHYS 488, but additional work required.

**Prerequisite(s):** PHYS 554 or consent of instructor.

**PHYS 589. Modern Materials****3 Credits**

Same as PHYS 489 with differentiated assignments for graduate students.

**Prerequisite:** PHYS 554 or consent of instructor.

**PHYS 591. Advanced High-Energy Physics I****3 Credits**

Taught with PHYS 491 with additional work required at the graduate level.

**Prerequisite(s):** PHYS 555 or consent of instructor.

**PHYS 592. Advanced High-Energy Physics II****3 Credits**

Continuation of topics in PHYS 591

**Prerequisite(s):** PHYS 591.

**PHYS 593. Advanced Experimental Nuclear Physics****3 Credits (1+6P)**

Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

**PHYS 597. Space Plasma Physics****3 Credits**

Same as PHYS 497 but with added requirements.

**PHYS 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**PHYS 600. Research****1-15 Credits**

Doctoral research. May be repeated.

**PHYS 620. Advanced Topics in Physics****1-3 Credits**

Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**PHYS 650. General Relativity I****3 Credits**

Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.

**Prerequisite(s):** PHYS 511 or PHYS 561 or consent of instructor.

**PHYS 680. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** graduate standing or consent of instructor.

**PHYS 688. Advanced Condensed Matter Physics****3 Credits**

Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

**PHYS 689. Advanced Modern Materials****3 Credits**

Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces.

**Prerequisites:** PHYS 555, PHYS 588, or consent of instructor.

**PHYS 691. Quantum Field Theory I****3 Credits**

Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.

**Prerequisites:** PHYS 555 and PHYS 562, or consent of instructor.

**PHYS 692. Quantum Field Theory II****3 Credits**

QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.

**Prerequisite:** PHYS 691 or consent of instructor.

**PHYS 700. Doctoral Dissertation****1-15 Credits (1-15)**

Dissertation.

**Phone:** (575) 646-3831

**Website:** <http://physics.nmsu.edu/>

## Engineering Physics - Bachelor of Science in Engineering Physics

The Bachelor of Science in Engineering Physics is a joint degree program of the Department of Physics and the College of Engineering. This degree is ideal preparation for technical careers in high-tech industries, research laboratories, and the public sector. It also provides an excellent preparation for graduate studies in physics or engineering. A full description of the program requirements can be found in the College of Engineering (p. 596) section of this catalog.

## Physics - Bachelor of Arts

The curriculum for the Bachelor of Arts degree is designed for students who would like to have a firm foundation in physics combined with study

in another area and greater flexibility in choosing elective courses. The program requires a minor in a second field of study chosen by the student in consultation with an advisor.

### Nondepartmental Requirements <sup>1</sup>

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3
Select 18 credits from a Minor in a second field from another department		18

### Department Requirements <sup>1</sup>

PHYS 150	Elementary Computational Physics	3
PHYS 213	Mechanics	3
PHYS 213 L	Experimental Mechanics	1
PHYS 214	Electricity and Magnetism	3
PHYS 214 L	Electricity and Magnetism Laboratory	1
PHYS 217	Heat, Light, and Sound	3
PHYS 217 L	Experimental Heat, Light and Sound	1
PHYS 315	Modern Physics	3
PHYS 315 L	Experimental Modern Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3

### Electives

Select sufficient electives to bring total number of credits to 128, including 48 upper-division. 54

### Second Language Requirement: (required - see below)

Total Credits 128

<sup>1</sup> May not be taken S/U and must earn a grade of C- or better.

## Second Language Requirement

For the Bachelor of Arts in the Physics there is a one year second language requirement, the student must do one of the following:

### Option 1:

Complete two semesters from the following:

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

For Heritage Learners:

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

### Option 3:

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	
OR		

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Suggested Minors for the Bachelor of Arts Physics Major

**Basic Science Minor**— A minor in a related scientific field broadens the overall knowledge of the student majoring in physics. Some departments which offer such minors are astronomy, chemistry, computer science, geology and mathematics.

**Prehealth Minor**— Students wishing to attend a medical or dental post-graduate school are strongly encouraged to obtain a minor in a life science field such as biochemistry, biology, human biology or microbiology.

**Prelaw Minor**— Students wishing to attend a post-graduate law school should obtain a minor in a law-related field, such as government, accounting, finance, international business or a Supplementary Major in Law and Society (24 credits).

## Physics - Bachelor of Science

A Bachelor of Science degree in physics at NMSU prepares a student well for graduate study in physics, geophysics, or engineering or for a variety of careers in research and teaching. Specialization in one of the emphasis areas should increase employability at the BS level.

### Nondepartmental Requirements <sup>1</sup>

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3
Select one of the following:		8
CHEM 111G & CHEM 112G	General Chemistry I and General Chemistry II	
CHEM 115 & CHEM 116	Principles of Chemistry I and Principles of Chemistry II (or higher-level courses)	

### Department Requirements <sup>1</sup>

PHYS 150	Elementary Computational Physics	3
PHYS 213	Mechanics	3
PHYS 213 L	Experimental Mechanics	1
PHYS 214	Electricity and Magnetism	3
PHYS 214 L	Electricity and Magnetism Laboratory	1
PHYS 217	Heat, Light, and Sound	3
PHYS 217 L	Experimental Heat, Light and Sound	1
PHYS 315	Modern Physics	3
PHYS 315 L	Experimental Modern Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3
Select an additional 6 credits in physics or geophysics numbered 300 or above		6

### Advanced Laboratory

Select at least 3 credits from the following (in any combination):		3
PHYS 471	Modern Experimental Optics	
PHYS 475	Advanced Physics Laboratory	
PHYS 493	Experimental Nuclear Physics	

### Electives

Select sufficient electives to bring total number of credits to 55 128, including 48 upper-division.

### Second Language Requirement: (required - see bottom of the page)

Total Credits	128
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<sup>1</sup> May not be taken S/U and must earn a grade of C- or better.

Students who plan to pursue graduate study in physics or geophysics are strongly advised to take one or more senior-level courses in optics, nuclear physics, space physics, condensed matter physics, geophysics, or computational physics.

Students who plan to seek employment at the B.S. level are advised to take one of the following concentration area curricula in addition to the general and departmental requirements. The program of study should be chosen by the student in consultation with an advisor. Some recommended courses are listed below.

## Concentration: Applied Optics

### Required Courses

PHYS 473	Introduction to Optics	4
PHYS 478	Fundamentals of Photonics	4
Total Credits		8

## Concentration: Applied Physics

The program of study in applied physics is planned by the student and the physics advisor and includes 12 credits of upper division classes in electrical and mechanical engineering along with classes in computer science.

## Concentration: Computational Physics

### Required Courses

C S 157	Topics in Software Programming and Applications	3
or C S 150	C Programming	
C S 171G	Introduction to Computer Science	4
MATH 279	Introduction to Higher Mathematics	3
PHYS 476	Computational Physics	3
Total Credits		13

## Concentration: Geophysics

### Required Courses

GEOL 111G	Introductory Geology	4
GPHY 340V	Planet Earth	3
GPHY 450	Selected Topics <sup>1</sup>	3
Upper-division course in the general area of geophysics/geology <sup>2</sup>		3
Total Credits		13

<sup>1</sup> For the geophysics concentration, students must take at least three credits of GPHY 450 Selected Topics.

<sup>2</sup> The upper-division course should be agreed upon between the student and the geophysics advisor.

## Concentration: Materials Science

### Required Courses

CHME 361	Engineering Materials	3
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PHYS 475	Advanced Physics Laboratory <sup>3</sup>	3
PHYS 488	Introduction to Condensed Matter Physics	3
PHYS 489	Introduction to Modern Materials	3
Total Credits		12

<sup>3</sup> For the materials science concentration, students must take three credits of PHYS 475 Advanced Physics Laboratory.

Geophysics courses are offered by the Department of Physics and are listed under "Geophysics" in the course description chapter of this catalog.

## Second Language Requirement

For the Bachelor of Science in the Physics there is a one year second language requirement, the student must do one of the following:

### Option 1:

Complete two semesters from the following:

CHIN 111	Elementary Chinese I	4
or FREN 111	Elementary French I	
or GER 111	Elementary German I	
or JPNS 111	Elementary Japanese I	
or SPAN 111	Elementary Spanish I	
CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or JPNS 112	Elementary Japanese II	
or SPAN 112	Elementary Spanish II	

*For Heritage Learners:*

SPAN 213	Spanish for Heritage Learners II	3
or SPAN 214	Spanish for Heritage Learners III	
or PORT 213	Portuguese for Romance Language Students I	
or PORT 214	Portuguese for Romance Language Students II	

### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3

### Option 3:

Challenge the 112 level for the following courses:

CHIN 112	Elementary Chinese II	4
or FREN 112	Elementary French II	
or GER 112	Elementary German II	
or SPAN 112	Elementary Spanish II	
<i>OR</i>		

Challenge the 213 level for the following courses:

PORT 213	Portuguese for Romance Language Students I	3
or SPAN 213	Spanish for Heritage Learners II	

### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Dual Degree (BS/MS) Program

This program option is designed to provide a means for PHYS undergraduates to obtain both a BS and an MS degree with 146 credits (normally: BS=128 credits, MS=30 credits). Students electing this option will follow the regular undergraduate BS in physics curriculum, except that they take the advanced laboratory course at the 5XX level to meet their BS requirements. They also apply nine other credits of their undergraduate courses numbered 450 and higher towards their MS degree, requiring only an additional 18 credits for the MS. These 18 credits can be obtained in two semesters (and perhaps one summer term to write and defend an MS thesis). Students interested in this dual degree must be admitted to the MS in Physics graduate program and must fulfill all degree requirements for the MS in Physics.

## Physics - Undergraduate Minor

A student cannot earn a BA or a BS in Physics and a minor in Physics. The minor in Physics requires a minimum of 18 credits distributed as follows:

### Requirements

PHYS 213	Mechanics	3
or PHYS 215G	Engineering Physics I	
PHYS 214	Electricity and Magnetism	3
or PHYS 216G	Engineering Physics II	

PHYS 315	Modern Physics	3
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Select 9 credits from the following: 9

PHYS 217	Heat, Light, and Sound	
Other Physics or Geophysics courses numbered 300 or above		

Select 0-6 credits from the following: <sup>1</sup> 0-6

A E 362	Orbital Mechanics	
C E 301	Mechanics of Materials	
CHME 361	Engineering Materials	
CHME 470	Introduction to Nuclear Energy	
CHME 471	Health Physics	

CHME 475	Nuclear Reactor Theory	
CHEM 431	Physical Chemistry	
	or CHEM 431 HPhysical Chemistry Honors	
CHEM 433	Physical Chemistry I	
	or CHEM 433 FPhysical Chemistry I Honors	
CHEM 434	Physical Chemistry II	
E E 425	Introduction to Semiconductor Devices	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
E E 479	Lasers and Applications	
M E 333	Intermediate Dynamics	
M E 338	Fluid Mechanics	
M E 340	Applied Thermodynamics	
Total Credits		18-24

<sup>1</sup> Other courses may be chosen with the approval of the Physics department head.

## Physics - Master of Science

For the master's degree, students must also successfully complete or transfer at least 30 course credits and pass a final oral examination or the doctoral comprehensive examination. Of these 30 credits, at least 21 must be in physics/geophysics, at most 3 may be for individual study or other informal courses, at most 6 may be for a thesis, and at most 9 may be numbered between 450 and 499. Students must successfully complete

PHYS 576	Advanced Computational Physics I	3
	or PHYS 476 Computational Physics	
Select 3 credits from the following:		3
PHYS 571	Advanced Experimental Optics	
PHYS 575	Advanced Physics Laboratory	
PHYS 593	Advanced Experimental Nuclear Physics	

A Master's thesis is optional. PHYS 599 Master's Thesis credits will not count toward the 21 credits in physics/geophysics and can only be counted toward the 30 credits for a Master's degree if a student selects the thesis option and successfully defends a Master's thesis. PHYS 700 Doctoral Dissertation credits can be used as a substitute for PHYS 599 Master's Thesis credits.

## Concentration: Space Physics

### Requirements

See above section for general requirements for the Master's degree.

For the master's degree with a concentration in Space Physics, students must successfully complete the following physics core and specialized courses:

<b>Physics Core</b>		
PHYS 551	Classical Mechanics	3
PHYS 593	Advanced Experimental Nuclear Physics	3
PHYS 511	Mathematical Methods of Physics I	3
	or PHYS 495 Mathematical Methods of Physics I	
PHYS 597	Space Plasma Physics	3
PHYS 554	Quantum Mechanics I	3

	or PHYS 454	Intermediate Modern Physics I	
PHYS 561		Electromagnetic Theory I	3
	or PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 584		Statistical Mechanics	3
	or PHYS 480	Thermodynamics	

### Specialization Electives

Select a minimum of three from the following:		9
ASTR 535	Observational Techniques I (f)	
ASTR 575	Computational Astrophysics	
ASTR 620	Planetary Surface and Atmospheric Processes	
ASTR 698	Special Topics.	
E E 460	Space System Mission Design and Analysis	
GPHY 540	Physics of the Earth and Planetary Interiors	
M E 533	Computational and Theoretical Fluid Mechanics	
PHYS 576	Advanced Computational Physics I	
	or PHYS 476 Computational Physics	
PHYS 591	Advanced High-Energy Physics I	
	or PHYS 491 High Energy Physics I	
Total Credits		30

## Physics - Doctor of Philosophy

For the Ph.D. degree, students must also pass the doctoral comprehensive examination, carry out original research, complete a dissertation, and pass a final oral examination. They must also pass or transfer at least 36 credits in formal courses numbered above 500 in physics/geophysics, including 24 credits of core graduate courses, and complete at least 6 credits of formal courses numbered above 600. The total number of credits, including formal and informal course credits and a minimum of 18 dissertation credits, must be at least 72. Financial support is available to graduate students in physics through teaching and research assistantships and fellowships. Inquiries about these opportunities should be directed to the graduate program director.

## Requirements

### Core Courses

PHYS 511	Mathematical Methods of Physics I	3
PHYS 551	Classical Mechanics	3
PHYS 554	Quantum Mechanics I	3
PHYS 555	Quantum Mechanics II	3
PHYS 561	Electromagnetic Theory I	3
PHYS 562	Electromagnetic Theory II	3
PHYS 576	Advanced Computational Physics I	3
PHYS 584	Statistical Mechanics	3
Select 3 credits from the following:		3
PHYS 571	Advanced Experimental Optics	
PHYS 575	Advanced Physics Laboratory	
PHYS 593	Advanced Experimental Nuclear Physics	

Total Credits 27

# Physics - Graduate Minor

## Eligibility

This minor is available to graduate students not majoring in Physics or Geophysics.

## Requirements

A student must satisfy the following requirements to earn a graduate minor in Physics:

- Successfully complete 12 credit hours of courses in Physics or Geophysics numbered above 500. Of these, not more than 3 credit hours can be for research, independent study, or other informal courses.
- Pass one of the four sections of the Physics Department's Qualifying Exam at the Ph.D. level.
- A member of the Physics faculty must be a member of the student's graduate committee.

# Psychology

## Undergraduate Program Information

Students may take a major in psychology either as an area of emphasis in a liberal arts program or in preparation for further graduate education leading to professional careers in psychology. A major in psychology may be appropriate for the liberal arts student who wishes to pursue a career involving extensive social interaction and requiring solutions to people-related problems. Such careers include law, business, parenting, government, education, and management. Professional careers in psychology generally require some post-baccalaureate education. These careers include provision of clinical and counseling services, conducting research, applying research findings in industrial or government settings, and doing teaching and research in colleges and universities. All students, but especially those planning to apply to graduate school, are encouraged to take PSY 310 Experimental Methods, no later than the Spring semester of their junior year.

Requirements for the Bachelor of Arts in Psychology are listed here (p. 414). Satisfying these requirements should provide an adequate exposure to psychology for the liberal arts student and a basic foundation for students seeking a career in psychology. Students wishing to prepare for a professional career in psychology are especially encouraged to work closely with an advisor, as early as possible.

## Graduate Program Information

### Admission

The Department of Psychology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. To maximize consideration for admittance, candidates should submit applications by January 15. Note that the Psychology Department does not offer training in counseling or clinical psychology.

Students will be admitted to graduate study on the basis of their potential for achievement in research, scholarship and teaching. The most promising applicants will be accepted. The number of students that the department can successfully accommodate is limited, therefore it will not always be possible to admit all qualified applicants. The admissions committee will consider any material that a candidate for admission wishes to present.

Students with bachelor degrees should apply for admittance to the master's program even if their eventual goal is a Ph.D. Students with a master's degree in psychology-related disciplines or from other institutions may apply directly to the Ph.D. program.

A completed Graduate School admission application (<https://gradschool.nmsu.edu/apply>) (online only) should include all of the following:

1. Complete transcripts of all college work (minimum 3.0 GPA).
2. Scores on the General Graduate Record Examination. Applicants to the MA program are most likely to be considered with minimum scores of 155 Verbal, 156 Quantitative, 4.5 Analytical Writing. Applicants to the PhD program are most likely to be admitted with minimum scores of 158 Verbal, 159 Quantitative, and 4.5 Analytical Writing. Scores on the GRE Psychology test are not required.
3. Three letters of recommendation from professors, employers or others qualified to evaluate your potential for graduate work .
4. A letter explaining your research interests and experience, career goals, and an indication of the faculty member(s) whose work is of particular interest to you .
5. A curriculum vitae or résumé.
6. A writing sample (e.g., a paper you wrote for a course, a senior thesis, or a master's thesis) uploaded through online application system. Ideally, the sample should demonstrate your ability to write clearly about psychological research.

As per NMSU Graduate School policy, admission to the doctoral program is conditional upon passing a qualifying exam. In Psychology this generally involves giving a presentation about a completed, empirical Masters thesis project to an examining committee. Also, if there are perceived gaps in preparedness, once at NMSU, candidates may be asked to complete certain coursework/research projects to address deficiencies.

A number of potential minors are available to interested students, including a minor in statistics (p. 450). Additional information about a minor may be found in the listing of the home department in this catalog.

## Degrees for the Department

Psychology - Bachelor of Arts

Psychology - Master of Arts (p. 415)

Psychology - Doctor of Philosophy (p. 416)

## Minors for the Department

Psychology - Undergraduate Minor (p. 415)

Psychology - (p. 417) Graduate Minor (p. 417)

**Associate Professor, Dominic A. Simon, Department Head**

**Professors** Trafimow; **Associate Professors** Dolgov, Fraune, Guynn, Ketelaar, Kroger, MacDonald, Madson, Marks; **Assistant Professors** Hout; **Emeritus Faculty** Cowie, Johnston, McDonald, Paap, Schvaneveldt, Stephan, Thompson.

*D.A. Simon, Department Head, Ph.D. (California- Los Angeles)– cognition, learning and performance; I. Dolgov, Ph.D. (Arizona State University)– perception and action, natural user interfaces, embodied cognition, human factors; M. Fraune (Indiana)- Human/Robot Interaction; M. J. Guynn, Ph.D. (New Mexico)– human memory; M.C. Hout, Ph.D. (Arizona State University)*

- visual cognition; T. Ketelaar, Ph.D. (Michigan)– social psychology, emotion; J. K. Kroger, Ph.D. (California-Los Angeles)– biopsychology, cognitive neuropsychology; J. MacDonald (Purdue)– engineering psychology, auditory perception; L.J. Madson, Ph.D. (Iowa State)– scholarship of teaching & learning, gender, sexuality; M.J. Marks, Ph.D. (Illinois, Urbana-Champaign)– social psychology, sexual behaviors, relationships; D. Trafimow, Ph.D. (Illinois, Urbana-Champaign)– social cognition.

## Psychology Courses

### PSY 201G. Introduction to Psychology

#### 3 Credits

Methods and principles of behavior. Topics include human evolution and development, biopsychology, perception, learning, thinking, motivation, social interaction, and the diagnosis and treatment of abnormal behavior.

### PSY 266. Applied Psychology

#### 3 Credits

Explanation of the psychological principles of everyday living. Emphasizes motivation, learning of intelligent behavior, and applications of psychology to social issues. Community Colleges only.

### PSY 274. A Study of Substance Abuse through Service Learning

#### 3 Credits

Physiological and psychological impact of drug use on human behavior. Emphasizes practical applications of intervention and prevention in the community. Community Colleges only.

### PSY 290. Psychology of Adjustment

#### 3 Credits

Analyzes the responses people have to conflict, emotional stress, and frustration. It focuses on adapting to these problems and examines both normal and neurotic responses. Community College campus only.

### PSY 301. Introduction to Psycholinguistics

#### 3 Credits

Psychological aspects of language, including linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as LING 301.

**Prerequisites:** PSY 201G and one of: STAT 251G, STAT 271G, or A ST 311; and PSY 310 or consent of instructor.

### PSY 302. Abnormal Psychology

#### 3 Credits

Introduces the types, causes, and treatment of mental disorders. Descriptions and explanations of the neuroses, affective disorders and the psychoses. Case histories are also analyzed.

**Prerequisites:** PSY 201G, MATH 120 and ENGL 111G.

### PSY 310. Experimental Methods

#### 4 Credits (2+4P)

The basic skills of literature search, experimental design, research methodology, and research reporting are emphasized; includes laboratory.

**Prerequisite(s):** PSY 201G, and either STAT 251G, STAT 271G, or A ST 311.

### PSY 311. Advanced Research Seminar

#### 4 Credits (2+4P)

Psychological research in conjunction with designing, conducting, writing, and presenting an independent research project. May also include various computer applications. Will discuss issues regarding application to graduate programs. Course should be taken no later than the first semester of senior year.

**Prerequisite:** PSY 310.

### PSY 315. Emotion

#### 3 Credits

An overview of the past century of research on human emotion from William James to Antonio Damasio. Explores a cognitive science perspective on emotion that includes questions about developmental, physiological, and evolutionary aspects of emotion and an exploration of the proximate and ultimate functions of emotion. Topics range from understanding the feeling component of emotion to understanding the role of facial displays of emotion.

**Prerequisite(s):** PSY 201G, and one of: STAT 251, STAT 271, or A ST 311G, and PSY 310 or consent of instructor.

### PSY 317. Social Psychology

#### 3 Credits

Ways in which people are influenced by the behavior of others are analyzed. Includes aggression, altruism, conformity, attraction, sexual behavior, prejudice, and nonverbal behavior.

**Prerequisites:** PSY 201G, MATH 120, and ENGL 111G.

### PSY 320. Learning

#### 4 Credits (3+2P)

Covers: habituation, Pavlovian conditioning, Thorndikian learning, stimulus generalization, transfer of training, and the learning and forgetting of related and unrelated material.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310.

### PSY 321. Psychology of Personality

#### 3 Credits

Introduces personality theories and supporting research. Psychoanalytic, physiological, and behavioral theories as they apply to personality are examined. Focuses on normal personality functioning.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310.

### PSY 324. Sexual Behavior

#### 3 Credits

Examines viewpoints of the evolution, control and function of human sexual behavior. Includes human sexuality, reproduction, male-female conflicts and the social implications of sex. Prerequisites: PSY 201G, MATH 120, and ENGL 111G

### PSY 325. Health Psychology

#### 3 Credits

Life stress, surgical stress, coronary-prone behavior, biofeedback, pain control, psychosocial approaches to geriatrics and cancer, behavioral treatments for addictions, obesity, and interpersonal issues in health care.

**Prerequisite:** PSY 201G.

### PSY 330. Psychology and the Law

#### 3 Credits

Discretionary practices in the judicial system including pretrial procedures, jury selection, jury decision making, eyewitness testimony, insanity, expert witnesses, and probation judgments.

**Prerequisite:** PSY 201G.

### PSY 340. Cognitive Psychology

#### 3 Credits

Review of research and theory in the study of human cognitive processes. Topics include information processing, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning. May be repeated up to 3 credits.

**Prerequisite(s):** PSY 201G, MATH 120, and ENGL 111G.

**PSY 342. Cognitive Neuroscience****3 Credits**

Introduction to the study of the neural mechanisms underlying cognitive processes. Topics include relations between neural processes and attention, perception, memory, thinking and language; measuring changes in electrical activity, blood flow, and metabolism in the brain during cognition; the problem of consciousness; and evolutionary perspectives.

**Prerequisites:** PSY 201G and PSY 310.

**PSY 350. Developmental Psychology: Conception through Childhood****3 Credits**

Covers a wide range of topics concerning human psychological development from conception through childhood with special emphasis on current research and theory. May be repeated up to 3 credits.

**Prerequisite(s):** PSY 201G, MATH 120, and ENGL 111G.

**PSY 351. Developmental Psychology: Adolescence through Old Age****3 Credits**

Covers a wide range of topics concerning human psychological development from adolescence through old age with special emphasis on current research and theory.

**Prerequisite:** PSY 201G.

**PSY 359. Psychology of Gender****3 Credits**

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. May be repeated up to 3 credits. Crosslisted with: W S 359.

**Prerequisite(s):** PSY 201G.

**PSY 370. Special Topics****1-3 Credits**

May be taken under different subtitles announced in the Schedule of Classes for unlimited credit. May be repeated for a maximum of 12 credits.

**Prerequisite:** PSY 201G.

**PSY 375. Psychology and the Brain****3 Credits**

An exploration of how the brain produces thinking, emotion, and behavior. May be repeated up to 3 credits.

**Prerequisite(s):** PSY 201G, MATH 120 and ENGL 111G.

**PSY 376. Evolutionary Psychology****3 Credits**

This course introduces the student to the science of Evolutionary Psychology. In this class we will explore how evolutionary psychologists think about a variety of topics ranging from our capacity for (and appreciation of) art, emotions, and beauty to an exploration of the "design" of our minds in regards to mating, status striving, social behavior and cultural production.

**Prerequisite(s):** PSY 201G, and one of: STAT 251, STAT 271, or A ST 311G, and PSY 310 or consent of instructor.

**PSY 380. Perception****4 Credits (4+4P)**

Primary emphasis on vision. Topics include measurement of sensations, development of visual-motor coordination, reading, speech perception, picture perception, illusions, 3-dimensional space, and causes and consequences of visual abnormalities.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310.

**PSY 383. Memory****3 Credits**

Examines facets of human memory from the information processing viewpoint, including encoding, storage, and retrieval and memory-aiding techniques.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 384. Perceptual and Cognitive Development****3 Credits**

Development across the lifespan in perception, memory, attention, reasoning, language and academic skills.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 400. Research****1-3 Credits**

Individual research projects supervised by a department faculty member. May be repeated for a maximum of 6 credits.

**Prerequisites:** PSY 310 and consent of instructor.

**PSY 401. Directed Readings****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisites:** PSY 201G and consent of instructor.

**PSY 402. Field Experience****1-3 Credits**

Working with preschool, juvenile delinquent, handicapped, aged, convict, or mentally ill. Approximately five hours scheduled work per week per credit. May be repeated to 6 credits.

**Prerequisites:** 6 psychology credits and consent of instructor.

**PSY 417V. Intercultural Relations****3 Credits**

Exploration of cultural and subcultural differences from a psychological perspective. Emphasis on modern cultural settings. Issues may include: ethnocentrism, stereotyping, intercultural communication, culture shock, cultural differences, nonverbal behavior, conflict management, and developing intercultural interaction skills.

**Prerequisite:** PSY 201G.

**PSY 430. Human-Computer Psychology****3 Credits**

Theories, methodologies, and data from psychology applicable to interface design, with an emphasis on construction and application of conceptual psychological models.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 440. History and Systems of Psychology****3 Credits**

History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Also covers recent history of psychology and development of schools of psychology.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 442. Thinking****3 Credits**

Research and theory pertaining to human thinking and problem solving. Effective problem-solving methods and common obstacles to problem solving are analyzed.

**Prerequisites:** PSY 201G and PSY 310.

**PSY 445. Clinical Psychology****3 Credits**

Basic theories in clinical psychology and techniques of psychotherapy.

**Prerequisites:** PSY 201G, PSY 302, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 450. Senior Thesis****3 Credits**

A laboratory or field research project conducted under faculty supervision. Requires written research proposal, conduct of research, data analysis, and final written report. May be repeated for a maximum of 6 credits.

**Prerequisites:** PSY 310, 6 additional psychology credits, consent of supervising faculty member, and junior or above standing.

**PSY 470. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PSY 507. Quantitative Methods in Psychology I****3 Credits**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on distributions, probability and basic inferential statistics in Psychological research.

**Prerequisite(s):** An elementary statistics course or consent of instructor.

**PSY 508. Quantitative Methods in Psychology II****3 Credits**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on Analysis of Variance (ANOVA) in Psychological research.

**Prerequisite(s):** PSY 507 or equivalent.

**PSY 509. Quantitative Methods in Psychology III****3 Credits**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on multiple regression in Psychological research.

**Prerequisite(s):** PSY 507 or equivalent.

**PSY 510. Computer Methodology****3 Credits**

Use of computers in psychological research with emphasis on developing experimental control programs.

**PSY 520. Learning****3 Credits**

Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.

**PSY 522. Sensation and Perception****3 Credits**

Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.

**PSY 523. Methods in Cognitive Psychology****3 Credits**

Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems.

**Prerequisite(s):** PSY 524 or consent of instructor.

**PSY 524. Cognitive Psychology****3 Credits**

Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.

**PSY 525. Behavioral Neuroscience****3 Credits**

The biological basis of behavior with an emphasis on human cognitive functioning.

**PSY 527. Social Psychology****3 Credits**

Current and traditional theories, research findings, and research methodologies of social psychology.

**PSY 529. Methods in Social Psychology****3 Credits**

Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems.

**Prerequisite(s):** Graduate student in psychology or consent of instructor.

**PSY 530. Human-Computer Interaction****3 Credits**

Issues associated with human-computer interface design. Concepts, methods, and data from HCI, cognitive psychology, human factors, artificial intelligence, and psycholinguistics that apply.

**PSY 531. Human Memory****3 Credits**

Current and traditional theories and research findings related to human memory.

**PSY 535. Developmental Psychology****3 Credits**

Examines theoretical and empirical work in lifespan developmental psychology, with an emphasis on perceptual and cognitive development, language development, and social cognitive development.

**PSY 540. History and Systems of Psychology****3 Credits**

History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.

**PSY 543. Cognitive Neuroscience****3 Credits**

Introduction to the study of the neural mechanisms underlying cognitive processes. Topics include relations between neural processes and attention, perception, memory, thinking and language; measuring change in electrical activity, blood flow, and metabolism in the brain during cognition; the problem of consciousness; and evolutionary perspectives.

**PSY 547. Engineering Psychology****3 Credits**

Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.

**PSY 550. Teaching of Psychology****3 Credits**

This class serves both new and experienced teachers. It will help new teachers design and conduct a successful course and help experienced teachers improve their teaching.

**PSY 570. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes.

**PSY 590. Research Seminar in Psychology****1 Credit (1)**

Presentations on research by students, faculty, and guest speakers. May be repeated for credit.

**PSY 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

**PSY 599. Master's Thesis****15 Credits**

Thesis.

**PSY 600. Doctoral Research****1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

**PSY 698. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

**PSY 700. Doctoral Dissertation****15 Credits**

Dissertation.

**Administrative Assistant:** Bea Guzman

**Office Location:** Science Hall, Room 220

**Phone:** (575) 646-2502

**FAX:** (575) 646-6212

**Mailing Address:**

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New Mexico State University

P.O. Box 30001

Las Cruces, NM 88003-8001

USA

**Website:** <https://psychology.nmsu.edu/>

## Psychology - Bachelor of Arts

### General Requirements

Students must receive a C- or better in courses used to satisfy the departmental and nondepartmental requirements of the psychology major. Students must also complete all University degree requirements, which include: General Education requirements (p. 46), Viewing a Wider World requirements (p. 46), and elective credits to total 120 credits with 48 of them being upper division.

**Departmental Requirements**

PSY 201G	Introduction to Psychology	3
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Select one from the following: 3

PSY 302	Abnormal Psychology	
PSY 350	Developmental Psychology: Conception through Childhood	
PSY 440	History and Systems of Psychology	

*Research Methods*

PSY 310	Experimental Methods <sup>1</sup>	4
PSY 311	Advanced Research Seminar	4

*Basic Mechanisms*

Select 3 credits from the following:<sup>2</sup> 3

PSY 301	Introduction to Psycholinguistics	
PSY 375	Psychology and the Brain	
PSY 376	Evolutionary Psychology	
PSY 380	Perception	

*Acquisition and Use of Knowledge*

Select 3 credits from the following:<sup>2</sup> 3

PSY 320	Learning	
PSY 340	Cognitive Psychology	
PSY 383	Memory	
PSY 442	Thinking	

*Understanding Behavior*

Select one from the following:<sup>2</sup> 3

PSY 315	Emotion	
PSY 317	Social Psychology	
PSY 321	Psychology of Personality	

Additional Electives<sup>3</sup> 11

**Nondepartmental Requirements**

Select one from the following:<sup>4</sup> 3

STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
A ST 311	Statistical Applications	

Philosophy course 300-level or above<sup>5</sup> 3

At least three credits of introductory biology 3

Select one from the following:<sup>6</sup> 4

BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory <sup>7</sup>	

Second Language Option 13-15

Total Credits 60-62

<sup>1</sup> PSY 310 Experimental Methods: prerequisite of PSY 201G Introduction to Psychology

<sup>2</sup> requirements are to be met after the student has completed PSY 310 Experimental Methods (which has prerequisites of PSY 201G Introduction to Psychology, and either STAT 251G Statistics for Business and the Behavioral Sciences or STAT 271G Statistics for Psychological Sciences or A ST 311 Statistical Applications

<sup>3</sup> Additional electives to bring total credits in psychology to at least 34, with at least 24 of those 34 credits being upper division.

- <sup>4</sup> Students who are considering graduate study are strongly encouraged to take math classes beyond the minimum statistics course requirement.
- <sup>5</sup> PHIL 346 Philosophy of Mind or PHIL 351 Philosophy of Science recommended
- <sup>6</sup> A course that includes a laboratory is highly recommended, and is required if intended to satisfy Gen Ed Area III
- <sup>7</sup> Prerequisite: CHEM 110G Principles and Applications of Chemistry or CHEM 111G General Chemistry I or CHEM 115 Principles of Chemistry I

## Second Language Requirement

For the Bachelor of Arts in Communication Studies there is a two year second language requirement, the student must do one of the following:

### Option 1:

Complete one of the following sequences:

CHIN 111 & CHIN 112 & CHIN 211 & CHIN 212	Elementary Chinese I and Elementary Chinese II and Intermediate Chinese I and Intermediate Chinese II	14
FREN 111 & FREN 112 & FREN 211 & FREN 212	Elementary French I and Elementary French II and Intermediate French I and Intermediate French II	14
GER 111 & GER 112 & GER 211 & GER 212	Elementary German I and Elementary German II and Intermediate German I and Intermediate German II	14
JPNS 111 & JPNS 112 & JPNS 211 & JPNS 212	Elementary Japanese I and Elementary Japanese II and Intermediate Japanese I and Intermediate Japanese II	14
SPAN 111 & SPAN 112 & SPAN 211 & SPAN 212	Elementary Spanish I and Elementary Spanish II and Intermediate Spanish I and Intermediate Spanish II	14
PORT 213 & PORT 214	Portuguese for Romance Language Students I and Portuguese for Romance Language Students II	6

#### For Heritage Speakers:

SPAN 113 & SPAN 213 & SPAN 214	Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	9
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### Option 2:

Complete two semesters of American Sign Language (with a C- or better):

C D 374	American Sign Language I	3
C D 375	American Sign Language II	3
C D 476	American Sign Language III	3

### Option 3:

Challenge the 212 level for the following courses:

CHIN 212	Intermediate Chinese II	3
or FREN 212	Intermediate French II	
or GER 212	Intermediate German II	

or JPNS 212	Intermediate Japanese II
or SPAN 212	Intermediate Spanish II

OR

### Challenge the 214 level for the following courses:

PORT 214	Portuguese for Romance Language Students II	3
or SPAN 214	Spanish for Heritage Learners III	

### Option 4: Computer Science Track

C S 153	Python Programming I	3
C S 154	Python Programming II	3
C S 158	R Programming I	3
C S 159	R Programming II	3

Under special circumstances, alternative combinations of CS courses may be approved by the Department Head

Total Credits		12
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### Option 5: Math Track

MATH 121G	College Algebra	3
MATH 190G	Trigonometry and Precalculus	4
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4

Total Credits		15
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### Option 6:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 7:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 8:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 9:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 10:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## Psychology - Undergraduate Minor

A student must pass at least 18 credits in Psychology courses with grades of C- or higher, and at least 9 of those credits must be upper division. A student may not earn both a BA in Psychology and a minor in Psychology.

## Psychology - Master of Arts

The department offers an MA degree in general experimental psychology. The program provides students with sufficient electives to emphasize a particular sub-area of experimental psychology. The program is

designed to provide graduates with the tools and knowledge necessary for further training at the doctoral level or for employment in industry or government.

MA students are required to complete:

#### First Year Research Project

PSY 598	Special Research Programs	4-6
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<b>Core Course (corresponding to the student's area of study):</b>		3
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PSY 524	Cognitive Psychology	
PSY 527	Social Psychology	
PSY 547	Engineering Psychology	

<b>Two other Content Courses:</b>		6
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PSY 520	Learning	
PSY 522	Sensation and Perception	
PSY 525	Behavioral Neuroscience	
PSY 530	Human-Computer Interaction	
PSY 531	Human Memory	
PSY 535	Developmental Psychology	
PSY 540	History and Systems of Psychology	
PSY 543	Cognitive Neuroscience	

#### The Quantitative Methods Sequence:

PSY 507	Quantitative Methods in Psychology I	3
PSY 508	Quantitative Methods in Psychology II	3
PSY 509	Quantitative Methods in Psychology III	3

#### Research Thesis:

PSY 590	Research Seminar in Psychology <sup>1</sup>	6
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<sup>1</sup> Students are also encouraged to register for one credit of PSY 590 Research Seminar in Psychology each semester.

Graduate courses fall into five categories:

Core: PSY 524 Cognitive Psychology, PSY 527 Social Psychology, PSY 547 Engineering Psychology

Quantitative Methods: PSY 507 Quantitative Methods in Psychology I, PSY 508 Quantitative Methods in Psychology II, PSY 509 Quantitative Methods in Psychology III

Experimental Methods: PSY 510 Computer Methodology, PSY 523 Methods in Cognitive Psychology, PSY 550 Teaching of Psychology

Content: PSY 520 Learning, PSY 522 Sensation and Perception, PSY 525 Behavioral Neuroscience, PSY 530 Human-Computer Interaction, PSY 531 Human Memory, PSY 535 Developmental Psychology, PSY 540 History and Systems of Psychology, PSY 543 Cognitive Neuroscience,

Supervised Research (MA): PSY 598 Special Research Programs, PSY 599 Master's Thesis

When offered, PSY 570 Special Topics may be considered content, quantitative methods, or experimental methods, depending on the specific course content.

## Psychology - Doctor of Philosophy

The Ph.D. in psychology is offered in the major areas of cognitive, engineering and social psychology. Ph.D. candidates are required to:

#### Core Course: (corresponding to the student's area of study)

PSY 524	Cognitive Psychology	
PSY 527	Social Psychology	
PSY 547	Engineering Psychology	

#### Quantitative Methods Sequence:

PSY 507	Quantitative Methods in Psychology I	3
PSY 508	Quantitative Methods in Psychology II	3
PSY 509	Quantitative Methods in Psychology III	3

#### Content Courses:

PSY 520	Learning	
PSY 522	Sensation and Perception	
PSY 525	Behavioral Neuroscience	
PSY 530	Human-Computer Interaction	
PSY 531	Human Memory	
PSY 535	Developmental Psychology	
PSY 540	History and Systems of Psychology	
PSY 543	Cognitive Neuroscience	

<b>Experimental/Quantitative Methods: (additional)</b>		6
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PSY 510	Computer Methodology	
PSY 523	Methods in Cognitive Psychology	
PSY 529	Methods in Social Psychology	
PSY 550	Teaching of Psychology	

#### Comprehensive Examination:<sup>1</sup>

#### Work related training requirement:<sup>2</sup>

#### Final Oral Examination:<sup>3</sup>

<b>Dissertation:</b>		18+
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PSY 700	Doctoral Dissertation	
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<sup>1</sup> pass written and oral components of the comprehensive exam

<sup>2</sup> complete a work-related training requirement (i.e. complete an internship of at least 10 weeks duration, or teach at least one 3-credit undergraduate course independently: pre-teaching requirements listed here)

<sup>3</sup> pass a final oral examination that consists primarily of an evaluation of the dissertation and the candidate's defense of it, but may extend over the entire field of the candidate's study,

Students are encouraged to register for one credit of PSY 590 Research Seminar in Psychology each semester.

Graduate courses fall into five categories:

Core: PSY 524 Cognitive Psychology, PSY 527 Social Psychology, PSY 547 Engineering Psychology

Quantitative methods: PSY 507 Quantitative Methods in Psychology I, PSY 508 Quantitative Methods in Psychology II, PSY 509 Quantitative Methods in Psychology III

Experimental Methods: PSY 510 Computer Methodology, PSY 523 Methods in Cognitive Psychology, PSY 550 Teaching of Psychology

Content: PSY 520 Learning, PSY 522 Sensation and Perception, PSY 525 Behavioral Neuroscience, PSY 530 Human-Computer Interaction, PSY 531 Human Memory, PSY 535 Developmental

Psychology, PSY 540 History and Systems of Psychology, PSY 543 Cognitive Neuroscience,

Supervised research (PhD): PSY 600 Doctoral Research, PSY 698 Special Research Programs, PSY 700 Doctoral Dissertation

When offered, PSY 570 Special Topics may be considered content, quantitative methods, or experimental methods, depending on the specific course content.

## Psychology - Graduate Minor

Students may earn a minor in psychology at the MA or Ph.D. level by completing the following:

### Required Coursework

Three courses from the following:

PSY 524	Cognitive Psychology <sup>1</sup>	3
PSY 527	Social Psychology <sup>1</sup>	3
PSY 547	Engineering Psychology <sup>1</sup>	3
PSY 520	Learning	3
PSY 522	Sensation and Perception	3
PSY 525	Behavioral Neuroscience	3
PSY 530	Human-Computer Interaction	3
PSY 531	Human Memory	3
PSY 535	Developmental Psychology	3
PSY 540	History and Systems of Psychology	3
PSY 543	Cognitive Neuroscience	3

<sup>1</sup> At least one course must be PSY 524 Cognitive Psychology, PSY 525 Behavioral Neuroscience or PSY 547 Engineering Psychology.

## Sociology

### Undergraduate Program Information

The undergraduate major in sociology is broad in scope. It prepares students for a variety of public and private sector employment opportunities including market research, personnel management, human relations, law enforcement and health services. Successful students often use their major as pre-professional preparation for advanced degrees in law, business, education, counseling and other social science based careers. Courses are offered both online and on campus.

### Graduate Program Information

The program is designed to prepare students for doctoral study in sociology as well as employment in research and applied areas of the field. In addition to the on-campus program, we also offer an online MA for students who are unable to attend in person. Through small seminars, on campus graduate students engage in discussions of subjects that often result in thesis and internship topics. In online seminars, small classes allow for in-depth discussions that can generate ideas for research as well as knowledge for applied work environments. In both online and on-campus settings, faculty members and students work toward the mutual goal of developing the full potential of each student.

### The Southwest and Border Region

Our unique location attracts faculty and students who are interested in peoples of the southwest, particularly Hispanics/Latinos and Native Americans. In addition, our proximity to the U.S.-Mexico border provides

an ideal laboratory for the examination of such issues as globalization, transnational migration and the consequences of border development.

### Social Inequality

Our faculty members examine the intersection of race, class and gender oppression in their teaching and research, with special attention to educational, rural/urban, ecological and global disparities. One goal of this examination is to address social problems such as poverty and racial/ethnic inequality.

### Program Options and Requirements

Students seeking a master's degree in sociology should have taken undergraduate courses in methods and statistics or their equivalent. Students who have not taken these courses should complete them before beginning their graduate study or as soon as possible in consultation with the sociology graduate director.

Graduate students in sociology have two program options, thesis or non-thesis. Faculty consider the students special interests and career plans in advising regarding their choice of program options. The thesis option is typically selected by students who intend to pursue a Ph.D. degree, while the non-thesis option is commonly pursued by those desiring immediate employment in research and applied areas in business, government, education, social welfare and health. The non-thesis, coursework only option is currently the only option available for on-line MA students. All students must pass a final master's examination.

## Degrees for the Department

Sociology - Bachelor of Arts (p. 422)

Sociology - Master of Arts (p. 422)

## Minors for the Department

Sociology - Undergraduate Minor (p. 422)

**Professor, David G. LoConto, Department Head**

**Professor** LoConto; **Associate Professors** Ortiz, Pelak, Rice, Steinkopf, Way; **Assistant Professors** Arnett, Newby; **College Associate Professor** Hovey; **Emeritus Professor** Hoffman, Loustaunau

*D. LoConto, Ph.D. (Oklahoma State University)– classical American social thought, popular culture, social psychology; S. Arnett, Ph.D. (University of Notre Dame)– education, race and ethnicity, social inequalities; K. Hovey, Ph.D. (University of New Mexico)– rural and urban communities, social control, criminological theory; C. A. Newby, Ph.D. (University of Texas at Austin)– race/ethnicity/minority relations, immigration, demography; D. Ortiz, Ph.D. (University of Notre Dame)– social movements, political sociology, Latin America; C. Pelak, Ph.D. (Ohio State University)– social inequalities, race and ethnicity, sociology of sport; J. Steinkopf-Rice, Ph.D. (Washington State University)– gender, globalization, communities; J.C. Rice, Ph.D. (Washington State University)– environment, society and technology, political sociology; S. Way, Graduate Program Director, Ph.D. (University of Arizona)– education, gender, juvenile delinquency.*

## Sociology Courses

### **SOC 101G. Introductory Sociology**

#### **3 Credits**

Introduction to social theory, research, methods of analysis, contemporary issues in historical and cross-cultural contexts. Covers groups, deviance, inequality, family, gender, social change, and collective behavior.

### **SOC 201G. Contemporary Social Problems**

#### **3 Credits**

Introduction to the fundamentals of social analysis through the analysis of contemporary American social problems. Emphasis on methods of analysis and cross-national comparisons showing that the social problems studied are common to all societies. Covers racism, violence, poverty, crime, health care, and substance abuse.

### **SOC 258. Current Issues in Marriage and Family**

#### **3 Credits**

Examination of contemporary American family life, including courtship, marriage, divorce, and child rearing. Community Colleges only.

### **SOC 262. Issues in Death and Dying**

#### **3 Credits**

Major personal and social issues related to the process of dying in our culture. Community Colleges only.

### **SOC 263. Human Sexuality**

#### **3 Credits**

Introduction to cultural and personal aspects of human intimacy, sexuality and the life cycle, sexual variation, and sexually transmitted diseases. Community Colleges only.

### **SOC 269. Sexualities and Society**

#### **3 Credits**

Examines various sexualities from a sociological perspective. Topics include sexual identity, intimate relationships, sexual desire, sexual behavior, the sex industry, and the politics of sexuality. Discussion of selected topics is grounded in both macro and micro sociological viewpoints. Restricted to: Main campus only.

### **SOC 273. Sex and Gender**

#### **3 Credits**

Analysis of changes, behaviors, and stereotypes of women and men in contemporary Western societies. Same as W S 273.

### **SOC 330V. Introduction to Religious Studies**

#### **3 Credits**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. Same as ANTH 330V and HIST 330V.

### **SOC 336V. Sociology of Pop Culture**

#### **3 Credits**

This course will provide students with a sociological look at creation, distribution, and effects of popular culture that have shaped, preserved, and conveyed distorted images of social class, race, gender and history to unwary consumers.

### **SOC 350. Sociological Foundations**

#### **3 Credits**

Focus is on becoming a sociologist including career opportunities, thinking critically about society, and conducting sociological inquiry. Emphasis is on identifying and using resources available to sociologists, communication skills for sociologists and acquisition of basic analytic techniques. Restricted to BA Sociology majors.

**Prerequisite(s):** SOC 101G or consent of instructor.

### **SOC 351. Sociological Theory**

#### **3 Credits**

Analysis of the main historical themes underlying contemporary sociological theory. May be repeated up to 3 credits.

**Prerequisite(s):** SOC 101G.

### **SOC 352. Social Research: Methods**

#### **3 Credits**

An introduction to research design and data collection strategies commonly employed in the social sciences. Topics include experiments, survey research and various other quantitative and qualitative methods. May be repeated up to 3 credits.

**Prerequisite(s):** SOC 101G.

### **SOC 353. Sociological Research: Analysis**

#### **3 Credits**

Elementary data analysis class emphasizing descriptive and inferential statistical techniques commonly employed in the social sciences. Topics range from one variable analysis through regression and correlation analysis of two variables. May be repeated up to 3 credits.

**Prerequisite(s):** SOC 101G.

### **SOC 357. Gender and Society**

#### **3 Credits**

Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives. Same as W S 357.

### **SOC 359. Sociology of the Family**

#### **3 Credits**

Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity.

### **SOC 360V. Introduction to Population Studies**

#### **3 Credits**

Determinants and consequences of changes in fertility, mortality and migration patterns. Introduction to techniques of demographic analysis. Focus on U.S. and world population issues and their relation to social, cultural, and economic systems.

### **SOC 361V. Social Issues in the Rural Americas**

#### **3 Credits**

Same as ANTH 361V.

### **SOC 362. Urban Society in a Global World: Problems, Prospects, and Promises**

#### **3 Credits**

Identification and analysis of the causes and consequences of social issues in urban environments including poverty, crime, terrorism, urban social policy, suburban flight, disinvestment, and deindustrialization. Special emphasis on global forces affecting global urban environments around the world.

**SOC 365. Environmental Sociology****3 Credits**

Societal responses to environmental problems including social adjustments to natural and technological hazards, socio-cultural aspects of technological risk and impact assessment, and emergence of environmental social movements.

**SOC 371. Race and Ethnic Relations****3 Credits**

Dynamics of racial prejudice and patterns of racial and ethnic interaction in the United States.

**SOC 374V. Comparative Family Systems****3 Credits**

A comparative analysis of family forms and characteristics in various societies. An examination of the diversity of family practices among ethnic and class groups in the United States. Same as W S 374G.

**SOC 375. Social Inequality****3 Credits**

Analysis of the social distinctions arising from sex, age, occupation, and ethnicity. Emphasis on indicators of social class and patterns of social mobility.

**SOC 376V. Social Change****3 Credits**

Explanations of autonomous and directed social change as occurring at the individual, organizational, societal, and international levels. Case studies from around the world.

**SOC 381. Individual and Society****3 Credits**

Ways people influence each other and the mutual interaction of the individual and society. Topics include attitudes, attitude change, conformity, liking and friendship patterns.

**SOC 390. Sociology of Childhood****3 Credits**

This course examines theories, methods, and empirical research in several areas of the sociology of childhood. Major themes are: (1) how social structure constrains children's lives, (2) how children negotiate, share, and create culture, and (3) how children's experiences vary within and across societies.

**SOC 391. Crime and Society****3 Credits**

Analysis of crime at the interpersonal, organizational, and social structure levels in society. Exploration of contemporary images of crime in mass media. Examination of connections between race, class, gender, and crime in U.S. society.

**SOC 392. Juvenile Delinquency****3 Credits**

Nature, extent, and causes of juvenile delinquency; juvenile justice; modern methods of treatment; programs of prevention.

**SOC 393. Youth and Society****3 Credits**

Comparative historical analysis of social, economic and cultural forces affecting young people. Emphasis on organizational and institutional effects on the well being of children and young adults.

**SOC 394V. Sports and Society: A Global Perspective****3 Credits**

A critical examination of sports in a global context, emphasizing the social and cultural factors that shape the world of sports and the consequences of sports for societies. Course examines issues of social inequality, violence, media and corporate influence, religion and sports, and the student-athlete experience.

**SOC 401. Introduction to Sociological Practice****3 Credits**

The application of sociological theory and research method. May be taught as service learning course. May be repeated up to 3 credits. Restricted to: SOC majors.

**Prerequisite(s):** SOC 101G, senior standing or consent of instructor.

**SOC 409. Community Development****3 Credits**

This is a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Topics include examining what 'community' means, community development versus economic development, and alternative economic activities.

**Prerequisite(s):** SOC 101G.

**SOC 430. Social Movement Theory****3 Credits**

Overview of key theories in past and present social movement research. Includes a focus on rational or spontaneous choice theories, resource mobilization, and new social movement theories. Theoretical perspectives focus on analyses of case studies including women's movement, civil rights, and environmental movements.

**SOC 448. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**SOC 449. Directed Readings****1-3 Credits**

Individual readings or research for either majors or nonmajors. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**SOC 457. Gender, Science, and Technology****3 Credits**

How gender, science and technology are interrelated social constructions. Science and technology are examined as social institutions. Explanations for different rates of participation based on race, class and gender are explored. Same as: W S 467.

**SOC 458V. Comparative Global Family Systems****3 Credits**

The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today.

**SOC 459. Advanced Issues in Sex and Gender****3 Credits**

Comprehensive examination of current gender identity and gender stratification issues. Same as W S 459.

**SOC 460. Sociology of Religion****3 Credits**

Examination of religion in its social context to understand the intricate relations of religion, culture and U.S. society. Recommended preparatory courses: SOC 101G, SOC 273, SOC 376, ANTH 125G.

**SOC 464. Human Society and the Environment****3 Credits**

This course explores the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships.

**Prerequisite(s):** SOC 101G.

**SOC 465V. Environmental Sociology****3 Credits**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements.

**SOC 470. Sociology of Latinos/as in the United States****3 Credits**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women's issues. Recommended preparatory courses: SOC 101G, SOC 270, SOC 371, or HIST 367.

**SOC 473. International Migration****3 Credits**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective.

**Prerequisite(s):** SOC 101G.

**SOC 474. Sociology of Organizations****3 Credits**

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment.

**SOC 477. Sociology of Education****3 Credits**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems.

**SOC 479. Sociology Perspectives on the U.S.-Mexico Border****3 Credits**

Theoretical perspectives and current research on the U.S.-Mexico border region, including topics such as migration, identity, health, gender, and environment.

**SOC 480. Diversity in Alternative Families****3 Credits**

Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life.

**SOC 481. Social Deviance****3 Credits**

Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control.

**SOC 482. Advanced Individual and Society****3 Credits**

Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and inter-group conflict.

**SOC 486. Power and Politics in America****3 Credits**

This course provides an introduction to the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems and facilitates the understanding of the processes and consequences of power distributions in the United States.

**Prerequisite(s):** SOC 101G.

**SOC 489. Globalization****3 Credits**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as GOVT 469.

**SOC 491. Criminological Theory****3 Credits**

Schools of thought, contrasting approaches, and contemporary efforts in theory construction relevant to adult and juvenile offenders.

**SOC 496. Internship****1-6 Credits**

Supervised participation in an appropriate community setting. Taught with SOC 596. May be repeated up to 9 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**SOC 501. Perspectives on Sociology****3 Credits**

Overview of the field, subfields, and faculty available for students at NMSU. Emphasis on theories and research currently being developed in the Sociology program. Graded: S/U. May be repeated up to 3 credits. Restricted to: Soc majors. S/U Grading (S/U, Audit).

**SOC 509. Advanced Seminar in Community Development****3 Credits**

This is in an advanced seminar addressing a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable.

**Prerequisite(s):** Graduate student standing.

**SOC 530. Advanced Social Movement Theory****3 Credits**

Overview of key theories in past and present social movement research. Topics include a focus on rational or spontaneous choice theories, resource mobilization, and new social movement theories. Theoretical perspectives focus on analysis of case studies including women's movement, civil rights, and environmental movements.

**SOC 548. Graduate Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes.

**SOC 549. Special Research Problems****1-3 Credits**

Individual analytic or experimental investigations. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**SOC 551. Issues in Advanced Quantitative Analysis****3 Credits**

Advanced methods of sociological analysis are examined in detail. Restricted to: SOC majors.

**SOC 552. Seminar in Classical Social Theory****3 Credits**

Analysis of classical social thought within the discipline. Restricted to: SOC majors.

**SOC 553. Seminar in Sociological Research****3 Credits**

Exploration of research methods, issues, and practical application. May be repeated up to 3 credits. Restricted to: Soc majors.

**SOC 558. Seminar: Sociology of the Family****3 Credits**

The family in various societies; evolution of the American family.

**SOC 559. Graduate Seminar in Sex and Gender****3 Credits**

Comprehensive examination of current gender identity and gender stratification issues. Same as W S 559.

**SOC 560. Advanced Sociology of Religion****3 Credits**

Examination of religion in its social context to understand the intricate relations of religion, culture and U.S. society.

**SOC 561. Seminar in Qualitative Research Methods****3 Credits**

This course provides an in-depth examination of qualitative research methods, including the logic, time, and purpose of using such methods.

**Prerequisite(s):** Graduate standing.

**SOC 564. Seminar in Human Society and the Environment****3 Credits**

This is an advanced seminar exploring the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships.

**Prerequisite(s):** Graduate Student Status.

**SOC 565. Advanced Environmental Sociology****3 Credits**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements.

**SOC 569. Advanced Issues in Sexualities****3 Credits**

Various issues in sexualities are addressed through a wide range of theoretical and empirical sociological literatures that involve quantitative and qualitative data. Advanced examination of the ways in which sexuality is constituted in local, cultural and institutional environments.

**SOC 570. Advanced Sociology of Latinos/as in the United States****3 Credits**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women s issues.

**SOC 571. Advanced Race and Ethnic Relations****3 Credits**

In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S.

**SOC 572. Advanced Sociology of Medical Ethics****3 Credits**

Major issues in the roles and relationships of health care providers and consumers, problems in communication, malpractice, patients rights, and ethics. Taught with SOC 472 with additional work required at the graduate level.

**SOC 574. Sociology of Organizations****3 Credits**

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment.

**SOC 575. Graduate Social Stratification****3 Credits**

Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender.

**SOC 577. Advanced Sociology of Education****3 Credits**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems.

**SOC 578. Advanced Sociology of Development and the World System****3 Credits**

Sociological approach to development and the global system. Theories of development, and underdevelopment; world poverty/inequality; Latin America; Africa and Asia in comparative perspectives; transnational borders/U.S.-Mexico border; current topics. Same as GOVT 577.

**SOC 579. Advanced Sociological Perspectives on the U.S.-Mexico Border****3 Credits**

Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment.

**SOC 580. Diversity in Alternative Families****3 Credits**

Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life.

**SOC 582. Individual and Society****3 Credits**

Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict.

**SOC 583. Symbolic Interaction****3 Credits**

Examination of the interaction of self and the social order including society as process, the negotiation of social order, identity as a social product, role taking and the situated self, the social construction of reality with an emphasis on phenomenology and ethnomethodology.

**SOC 586. Advanced Seminar in Power and Politics in the United States**  
**3 Credits**

This is an advanced seminar addressing the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems. It facilitates an understanding of the processes and consequences of power distributions in the United States.

**Prerequisite(s):** Graduate student standing.

**SOC 587. Advanced International Migration**  
**3 Credits**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective.

**Prerequisite(s):** Graduate student standing.

**SOC 589. Advanced Issues in Globalization**  
**3 Credits**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as GOVT 569.

**SOC 596. Internship**  
**1-6 Credits**

Supervised participation in appropriate occupational setting. May be repeated for a maximum of 12 credits. Taught with SOC 496 with additional work required at the graduate level.

**SOC 599. Master's Thesis**  
**6 Credits**

Thesis. Consent of instructor required. Restricted to: Main campus only. Restricted to SOC majors.

**Phone:** (575) 646-3448

**Website:** <http://sociology.nmsu.edu>

## Sociology - Bachelor of Arts

### Departmental Requirements

SOC 101G	Introductory Sociology	3
SOC 351	Sociological Theory	3
SOC 352	Social Research: Methods <sup>1,2</sup>	3
SOC 353	Sociological Research: Analysis <sup>1</sup>	3
SOC 401	Introduction to Sociological Practice	3

**Departmental Electives**

Select sufficient electives in sociology to bring total credits in major to 33, including 24 upper-division of which 6 credits must be 400 level (excluding SOC 401).<sup>3</sup>

Total Credits 33

<sup>1</sup> Criminal Justice/Sociology double majors may be permitted to substitute C J 300 Introduction to Criminal Justice Research for SOC 352 Social Research: Methods and C J 301 Advanced Research Methods for SOC 353 Sociological Research: Analysis.

<sup>2</sup> Government/Sociology double majors may be permitted to substitute GOVT 300 Political Research Skills for SOC 352 Social Research: Methods upon approval of appropriate substitution/waiver forms.

<sup>3</sup> The six credits of SOC 400 electives does not include SOC 401 Introduction to Sociological Practice. SOC 449 Directed Readings can be applied to this requirement. A maximum of six credits of SOC 449 Directed Readings is allowed. In addition, for those in the Master's Accelerated Program, SOC 500 electives can be used to meet the six credit requirement.

In addition, substitution/waivers for courses may be available upon consultation with the Department Head in the Department of Sociology. In all cases, the total number of sociology credits (courses with SOC prefix) must be a minimum of 33.

## Degree Requirements

General Education Courses	35
Viewing a Wider World Courses	6
Departmental Requirements	33
Electives: to bring total to 120 credits, with 48 credits being upper-division	46
Total Credits	120

## Second Language

For the Bachelor of Arts in Sociology there is no second language requirement for the degree.

## Sociology - Undergraduate Minor

Students who earn a Bachelor of Arts in Sociology may not also earn a minor in Sociology. Students earning the minor must pass 18 credits with grades of C- or higher. Students may count S grades only in courses in which all grades are S/U. Students may substitute an upper division social research methods course for the required SOC 352 Social Research: Methods from the Departments of Criminal Justice and Government. Additional research methods courses may be considered. Please contact the Department Head of the Department of Sociology for further consideration. Students making this substitution must still pass 18 total credits in Sociology in order to earn this minor.

**Required Courses**

SOC 101G	Introductory Sociology	3
SOC 351	Sociological Theory	3
SOC 352	Social Research: Methods	3
Additional Sociology credits, of which at least 6 are upper division		9
Total Credits		18

## Sociology - Master of Arts

### Thesis Program Requirements

In addition to the successful completion of an acceptable master's thesis, students who choose this option will take a minimum of 36 credit hours of graduate work distributed as follows:

**Requirements**

SOC 501	Perspectives on Sociology <sup>1</sup>	3
SOC 551	Issues in Advanced Quantitative Analysis <sup>1</sup>	3
SOC 552	Seminar in Classical Social Theory <sup>1</sup>	3
SOC 553	Seminar in Sociological Research <sup>1</sup>	3

SOC 561	Seminar in Qualitative Research Methods <sup>1</sup>	3
SOC 599	Master's Thesis	6
Select an additional 15 credits from 500 level Sociology course work to be taken in consultation with the sociology graduate student's advisor.		15
Final master's oral examination covering all general coursework and the thesis.		
<b>Total Credits</b>		<b>36</b>

<sup>1</sup> To be taken within the first 27 hours of graduate credit. A grade of B- or better is required to receive credit for each of these core courses.

## Non-Thesis Program Requirements: Coursework Only

Students who choose this option will take a minimum of 36 credit hours of graduate work distributed as follows:

Requirements		
SOC 501	Perspectives on Sociology <sup>2</sup>	3
SOC 551	Issues in Advanced Quantitative Analysis <sup>2</sup>	3
SOC 552	Seminar in Classical Social Theory <sup>2</sup>	3
SOC 553	Seminar in Sociological Research <sup>2</sup>	3
SOC 561	Seminar in Qualitative Research Methods <sup>2</sup>	3
Select an additional 21 credits from 500 level Sociology course work to be taken in consultation with the sociology graduate student's advisor.		21
Final master's written examination covering all general coursework.		
<b>Total Credits</b>		<b>36</b>

<sup>2</sup> To be taken within the first 27 hours of graduate credit. A grade of B- or better is required to receive credit for each of these core courses.

## Admission Requirements

To apply for admission to the Sociology MA Program and the Graduate School, applicants must meet the following criteria and submit the following through <http://prospective.nmsu.edu/graduate/apply/index.html>

- Application form and fees
- An undergraduate cumulative GPA of at least 3.0 on a 4.0 scale.
- A record of professional, ethical, and collegial behavior.
- Official undergraduate and graduate transcripts from all colleges and universities attended.
- A well written statement of purpose from the candidate addressing graduate school objectives and interests.
- Three letters of recommendation describing personal qualities and achievements that suggest the applicant will be successful in the program. We prefer that letters of recommendation come from faculty members familiar with the academic work and professional conduct of the applicant.

Failure to meet any of the above criteria may result in the student not being accepted into our program. However, in cases when an otherwise

outstanding student does not meet the GPA requirements, the student may be accepted provisionally into the program.

The GRE is not required for admission. Students may be required to take prerequisites prior to gaining admission.

For priority consideration, the deadline for application is March 15 for Fall admission.

## Theatre Arts

### Undergraduate Program Information

With strong emphases in acting, musical theater, new works and design/technical theatre, the program prepares students for graduate study, life in the profession, or a myriad of related job fields. Students gain practical experience through a wide array of courses designed to expose them to the varied aspects and job positions involved in theatrical production. The faculty is augmented by nationally-renowned guest theatre artists.

A minimum of 62 credits with a grade of C- or higher in theatre arts is required for the major. Theatre Arts does not require a second language.

Students enrolled in this department's major or minor may count credits in required applied courses toward their degrees beyond the normal maximum of 9 credits allowed in the College of Arts and Sciences. However, if a student changes the major or does not complete the requirements for the minor at the time of graduation, they may only count a maximum of 9 credits of the applied credits toward graduation.

Students preparing to teach in public schools may qualify for certification by completing the Bachelor of Science in Education degree with theatre arts as a teaching field. (See curricula in the College of Education (p. 465) section).

At any time the Theatre Arts program may be undergoing curriculum changes. For the most up-to-date information about degree requirements please visit [www.nmsutheatre.com](http://www.nmsutheatre.com) (<http://www.nmsutheatre.com>) or visit the Theatre Arts Department at room 321 in the Center for the Arts Building.

### Degrees for the Department

Theatre Arts - Bachelor of Arts (p. 426)

### Minors for the Department

Theatre Arts - Undergraduate Minor (p. 427)

**Professor, Wil Kilroy, Department Head/Managing Director**

**Professor** Storm; **Assistant Professor** Hamilton, Lury; **College Associate Professor** C. Billings, J. Billings, D. Brunson; **College Assistant Professor** McQueen; **Professional Staff** Carruthers, Jaworski, Hereford, Wilkinson, Wise

### Theatre Arts Courses

**THTR 101G. The World of Theatre**  
**3 Credits**

An appreciation class introducing the non-major to all aspects of theatre, including its history, literature and professionals. Students attend and report on stage productions.

**THTR 105. Acting for Non-Majors****3 Credits**

An introduction to basic performance techniques for non-majors.

**THTR 110. Beginning Acting****3 Credits**

Basic understanding of self-expression through a variety of physical exercises, improvisation, and character study, culminating in scene or monologue work. Restricted to: THTR majors.

**THTR 120. Stage Movement****3 Credits**

Physical techniques for the actor to develop kinesthetic awareness and skills in characterization, archetypes, and stage combat. Restricted to: THTR majors.

**THTR 130. The Art of Theatre****3 Credits**

This course introduces the variety and scope of theatre professions, the value and goals of the theatre major and an analysis of the art form from script to stage. Restricted to: Required for THTR majors majors.

**THTR 141. Introduction to Stagecraft****3 Credits**

Basic techniques used in the construction of scenery, props, and sound. Lab required. Pre/

**Corequisite(s):** THTR 141L.

**THTR 141 L. Stagecraft Laboratory****1 Credit**

Class members will assist with construction for productions in a studio environment. Pre/

**Corequisite(s):** THTR 141.

**THTR 142. Introduction to Costume Crafts****3 Credits**

Common costume production techniques, including basic stitching, use of equipment, knowledge of available materials, dyeing, and 3-D.

**Prerequisite(s)/Corequisite(s):** THTR 142L. Restricted to: THTR majors.

**THTR 142 L. Costume Craft Lab****1 Credit**

Class members will assist in construction for productions in a studio environment. Pre/

**Corequisite(s):** THTR 142.

**THTR 149. Running Crew I****2 Credits (1+2P)**

Students learn about backstage and front of house production positions and work on a technical aspect of a production in a rehearsal and performance environment.

**THTR 200. Theatre Workshop I****0.5 Credits**

Required for all freshman and sophomore theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**THTR 210. Intermediate Acting: Scene Study and Monologues****3 Credits**

Monologues and scene work, using character and script analysis.

**Prerequisite(s)/Corequisite(s):** THTR 205. Prerequisite(s): THTR 110 with C- or above.

**THTR 220. Vocal Production for the Actor****3 Credits**

Exploration and development of the actor's vocal instrument, including relaxation, projection, diction and articulation. May be repeated up to 3 credits. Restricted to: THTR majors.

**THTR 222. Theatre Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

**THTR 249. Running Crew II****1 Credit**

Students work on a technical aspect of a production in a rehearsal and performance environment.

**THTR 250. Introduction to Design****3 Credits**

Introduction into our visual world via the language of designers, focusing on collaboration, creative thinking and presentation skills. The varied design professions in theatre and the performing arts will be explored. Restricted to: Required of all THTR Majors majors.

**THTR 300. Theatre Workshop II****0.5 Credits**

Required for all junior and senior theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**THTR 303. Theatre History I****3 Credits**

History of theatre and drama from ancient Greece to the English Renaissance.

**THTR 304. Theatre History II****3 Credits**

History of theatre and drama from the Restoration to the 20th century. May be repeated up to 3 credits.

**THTR 306. Screenwriting I****3 Credits**

Same as CMI 309, ENGL 309. Consent of instructor required. Crosslisted with: CMI 309 and ENGL 309

**Prerequisite(s):** ENGL/CMI 235.

**THTR 307V. Society in Style: Fashion, History and Culture****3 Credits**

History of clothing for theatrical purposes, origins and evolution of period clothing in relation to social, political, and aesthetic factors of different periods.

**THTR 308. Creative Writing: Playwriting****3 Credits**

Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: ENGL 308

**Prerequisite(s):** ENGL 111G.

**THTR 310. Styles in Acting****3 Credits**

Analysis of differing styles of acting through scene work representing various time periods and genres.

**Prerequisite(s):** THTR 210.

**THTR 311. Acting for Film and Television****3 Credits**

Specific techniques of acting for the camera are explored via hands-on experiential learning and an introduction to the business of the TV/Film industry

**Prerequisite(s):** THTR 110 or THTR 105 or permission of instructor.

**THTR 312. Acting Shakespeare****3 Credits**

Acting Shakespeare's tragedies and comedies, including text work, scansion, movement, scene work, and monologues.

**Prerequisite(s):** THTR 210.

**THTR 313. Improvisation****3 Credits**

Long and/or short form improvisation techniques in addition to a variety of exercises exploring terminology, character work and the elements of comedy.

**Prerequisite(s):** THTR 105 or THTR 110.

**THTR 314. Scene Study****3 Credits**

Studio class focusing on scene work and acting processes.

**Prerequisite(s):** THTR 210.

**THTR 317. Musical Theatre****3 Credits**

Acting class focused on developing and refining skills necessary for performing in musicals. Pre/ May be repeated up to 9 credits.

**Prerequisite(s)/Corequisite(s):** THTR 210.

**THTR 320. Auditioning and Marketing****3 Credits**

Techniques for choosing and preparing effective monologues, cold and prepared readings, head shots and resumes, and interview skills.

**Prerequisite(s):** THTR 210.

**THTR 321V. Modern European Drama****3 Credits**

Masterworks of European drama from the 19th century to the present. Crosslisted with: ENGL321V.

**THTR 322. Dramatic Character****3 Credits**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. May be repeated up to 3 credits. Crosslisted with: ENGL 322.

**THTR 323. American Drama****3 Credits**

Masterworks of American drama from the 20th century to the present. Crosslisted with: ENGL323.

**THTR 329. Studies in Drama****3 Credits**

Subtitles vary. Study of a group of related works of drama, theory, or theatre practice. Crosslisted with: ENGL329 and CMI329.

**THTR 334. Introduction to Stage Makeup****3 Credits**

Basic principles of stage makeup: straight, character, and specialty. Includes study of various products, methods of application, and the effects of lighting on makeup.

**THTR 337. Independent Study****1-3 Credits**

Students propose and design their own course not covered through regular course offerings under the guidance of faculty. May be repeated up to 6 credits. Consent of Instructor required.

**THTR 341. Scene Painting****3 Credits**

Use of historical painting techniques in a project-driven classroom. Projects include 2-D and 3-D work, color mixing and theory, painting scenery, and the use of paint for effects.

**Prerequisite(s):** THTR 141.

**THTR 343. Costume Patterning****3 Credits**

Basic techniques in the production of flat patterns for modern and period silhouettes including some draping techniques. Consent of Instructor required.

**THTR 345. Costume Practicum****1 Credit**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Costume Shop. Pre/

**Corequisite(s):** THTR 142.

**THTR 346. Scenic Practicum****1 Credit**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Scene Shop. Pre/

**Corequisite(s):** THTR 141.

**THTR 347. Lighting Practicum****1 Credit**

A practical course intended to provide students hands-on experience executing theatrical lighting.

**THTR 348. Running Crew III****1 Credit**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

**Prerequisite(s):** THTR 149.

**THTR 349. Running Crew IV****1 Credit**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

**Prerequisite(s):** THTR 149.

**THTR 352. Costume Design****3 Credits**

Basic principles of costume design, including script analysis, principles of design, drawing and painting.

**THTR 353. Scene Design****3 Credits**

Design for the performing arts. Basic design skills and projects to exercise those skills, history of design in the theatre and the designer's role in the production process. Final project includes a finished scene design.

**Prerequisite:** THTR 141 or consent of instructor.

**THTR 354. Sound Design****3 Credits**

Hands-on training in theatrical sound design and implementation.

**THTR 355. Lighting Design****3 Credits**

Basic aspects of theatre lighting, including electricity, color theory, history, and types of lighting instruments.

**THTR 356. Theatre Production****1-3 Credits**

Participation in the production of theatrical performances by stage managing, acting, designing, dramaturgy, or directing. May be repeated for a maximum of 6 credits. Graded S/U.

**THTR 357. Computer Scenographics****3 Credits**

Project-oriented course teaching basic computer modeling skills. Projects focus on the creation of communication tools designers use in the theatrical process. Students will develop portfolios of completed projects. Consent of instructor required.

**Prerequisite(s):** THTR 352, THTR 353, or THTR 355.

**THTR 360. Creative Drama****3 Credits (2+2P)**

Methods of developing original dramatizations. Emphasis on curriculum problems and teaching techniques in elementary and secondary schools.

**THTR 366. Summer Theatre****1-3 Credits**

Experience in professional or academic summer theatre. May be repeated for a maximum of 3 credits. Graded: S/U. Restricted to THTR majors.

**Prerequisite(s):** Consent of department head.

**THTR 384. Stage Management****3 Credits**

Study of stage management techniques and their application to play production. A working knowledge of union rules, and the procedure to facilitate these through proper communication skills.

**THTR 395. Directing I****3 Credits**

Study and application of basic stage directing techniques.

**Prerequisite(s):** THTR 105 or THTR 110.

**THTR 396. Theatre Management****3 Credits**

Study of issues related to managing a theatre company and producing plays. May be repeated up to 3 credits.

**THTR 408. Shakespeare I****3 Credits**

Same as ENGL 408.

**THTR 409. Shakespeare II****3 Credits**

Same as ENGL 409.

**THTR 410. Advanced Acting: Contemporary Methods****3 Credits**

Acting techniques will be explored focusing on current trends in the profession, from Stanislavski, to Hagen to Meisner.

**Prerequisite(s):** THTR 205.

**THTR 414. Collaborative Theatre-Making****3 Credits**

This course introduces students to the techniques, skills and practice of the collaborative creation of new theatrical material.

**Prerequisite(s):** THTR 110.

**THTR 417. Musical Theatre II****3 Credits**

A continuation of THTR 317, allowing for more advanced musical theatre techniques.

**Prerequisite(s):** THTR 317.

**THTR 430. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

**THTR 435. Directed Reading****1-3 Credits**

Directed individualized studies. May be repeated for a maximum of 3 credits.

**THTR 439. Senior Seminar****3 Credits**

Course preparing students for professions in and related to the theatre. Restricted to: THTR majors.

**THTR 440. Senior Seminar Practicum****1 Credit**

Capstone course preparing students to apply knowledge of theatre arts toward advanced training or career objectives in the discipline. Consent of instructor required. Pre/ Restricted to THTR majors.

**Corequisite(s):** THTR 439.

**THTR 450. The Michael Chekhov Acting Intensive****3 Credits**

An intensive overview of the performance techniques attributed to Michael Chekhov, applied to theatrical scenes and presentations. May be repeated up to 6 credits. Consent of Instructor required.

**THTR 457. Advanced Computer Scenographics****3 Credits**

Project-oriented course for the advanced modeler. Projects focus on the creation of complex models, custom texturing and shading, virtual lighting, postproduction image work, and animation techniques. Students will develop digital portfolios.

**Prerequisite:** THTR 357 and consent of instructor.

**THTR 535. Directed Study****1-3 Credits (1-3)**

For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

**Name:** Wil Kilroy, Department Head

**Office Location:** ASNMSU Center for the Arts, Room 321

**Phone:** (575) 646-4517

**Website:** <http://www.nmsutheatre.com>

## Theatre Arts - Bachelor of Arts

### Departmental Requirements

THTR 110	Beginning Acting	3
THTR 120	Stage Movement	3
THTR 130	The Art of Theatre	3
THTR 141	Introduction to Stagecraft	3
THTR 141 L	Stagecraft Laboratory	1
THTR 142	Introduction to Costume Crafts	3
THTR 142 L	Costume Craft Lab	1

THTR 149	Running Crew I	2	DANC 124	Jazz Technique I	1
THTR 200	Theatre Workshop I (.5x4 semesters) <sup>2</sup>	2	DANC 224	Jazz Technique II	2
THTR 220	Vocal Production for the Actor	3	THTR 317	Musical Theatre	3
THTR 249	Running Crew II	1	THTR 417	Musical Theatre II	3
THTR 250	Introduction to Design	3	Select 3 credits from the following:		3
THTR 300	Theatre Workshop II (.5 x 4 semesters) <sup>2</sup>	2	DANC 127	Tap Dance I	
THTR 303	Theatre History I	3	DANC 227	Tap Dance II	
THTR 304	Theatre History II	3	DANC 123	Ballet Technique I	
THTR 345	Costume Practicum	1	DANC 126	Modern Dance Technique I	
THTR 346	Scenic Practicum	1	DANC 223	Ballet Technique II	
THTR 347	Lighting Practicum	1	DANC 226	Modern Dance Technique II	
THTR 348	Running Crew III	1	DANC 323	Ballet Technique III	
THTR 349	Running Crew IV	1	DANC 326	Modern Dance III	
THTR 395	Directing I	3	<i>Voice or Applied Music-Vocal</i>		
THTR 439	Senior Seminar	3	Select a minimum of six credits from the following: <sup>2</sup>		6
THTR elective courses			MUS 130	Applied Music	
Select one from the following:		3	MUS 160	University Singers	
THTR 321V	Modern European Drama		MUS 161	Concert Choir	
THTR 322	Dramatic Character		MUS 162	Master Works Chorus	
THTR 323	American Drama		MUS 251	Opera Workshop	
Select one from the following:		3	MUS 351	Opera Workshop	
THTR 352	Costume Design		MUS 361	Concert Choir II	
THTR 353	Scene Design		MUS 368	University Singers II	
THTR 354	Sound Design		<b>Second Language Requirement: (not required)</b>		
THTR 355	Lighting Design		Total Credits		18
Select 9 credits from THTR 300/400 level courses <sup>1</sup>		9			
<b>Electives</b>					
Select sufficient electives to bring total to 120, including 48 upper-division.					
<b>Second Language Requirement: (not required)</b>					
Total Credits		62			

<sup>1</sup> Courses from this category must not duplicate selections above.

<sup>2</sup> Theatre majors must enroll in Theatre Workshop each semester. THTR 200 for freshmen and sophomores and THTR 300 for juniors and seniors, 2 credits total for each course equaling a total of 4 credits.

<sup>3</sup> Complete a minimum of 120 credits, with 48 credits at the 300 level or above, including all general education and viewing a wider world requirements.

## Second Language Requirement

For the Bachelor of Arts in Theatre Arts there is no second language requirement for the degree.

## Concentration: Musical Theatre

The musical theatre concentration is designed to provide students with training in musical theatre performance, including singing, dancing and acting.

## Departmental Requirements

All courses required for the Theatre Arts major must be met, except for the requirement of 9 additional THTR courses.

### Departmental Requirements

DANC 124	Jazz Technique I	1
DANC 224	Jazz Technique II	2
THTR 317	Musical Theatre	3
THTR 417	Musical Theatre II	3
Select 3 credits from the following:		
DANC 127	Tap Dance I	
DANC 227	Tap Dance II	
DANC 123	Ballet Technique I	
DANC 126	Modern Dance Technique I	
DANC 223	Ballet Technique II	
DANC 226	Modern Dance Technique II	
DANC 323	Ballet Technique III	
DANC 326	Modern Dance III	

*Voice or Applied Music-Vocal*

Select a minimum of six credits from the following:<sup>2</sup> 6

MUS 130	Applied Music	
MUS 160	University Singers	
MUS 161	Concert Choir	
MUS 162	Master Works Chorus	
MUS 251	Opera Workshop	
MUS 351	Opera Workshop	
MUS 361	Concert Choir II	
MUS 368	University Singers II	

**Second Language Requirement: (not required)**

Total Credits 18

<sup>2</sup> Two of the required vocal credits may be in choral ensemble or opera workshop.

## Second Language Requirement

For the Bachelor of Arts in Theatre Arts with a Concentration in Musical Theatre there is no second language requirement for the degree.

## Theatre Arts - Undergraduate Minor

The Department of Theatre Arts has one minor in Theatre Arts. Students must pass a minimum of 9 lower division and 9 upper division THTR credits with grades of C- or higher to earn the minor. A student cannot earn both a BA in Theatre Arts and a minor in Theatre Arts.

# COLLEGE OF BUSINESS

Dean - *James Hoffman*

Associate Dean (Academics) - *Kathleen Brook*

Associate Dean (Research) - *William Gould*

## Mission of the College of Business

The College of Business transforms lives by providing highly respected programs, instruction and scholarly activities that drive economic, social, educational and community development for New Mexico's diverse population.

## Requirements for the Bachelor Degrees

- Successful completion of the New Mexico General Education Common Core and NMSU Viewing a Wider World Courses.
- Successful completion of College of Business Requirements below and major requirements. For the Bachelor of Arts in Economics, see the Economics and International Business (p. 440) section for specific requirements.
- A minimum cumulative grade point average (GPA) of 2.0 in all courses taken at NMSU to meet lower and upper division business core and major requirements.
- All majors except Economics and International Business require a minimum cumulative GPA of 2.0 in all courses taken to meet the requirements of the major. For Economics and International Business majors, a minimum cumulative GPA of 2.5 is required for courses taken to meet the requirements for the major.
- A minimum of 50% of business credits required for a Bachelor of Accountancy or Bachelor of Business Administration degree or 18 business credits required for a Bachelor of Arts in Economics degree must be completed in the College of Business and a minimum of 12 credits required in the major must be completed in the College. See sections below for major-specific transfer criteria. A total of no more than six credits of courses designated as 300E may be used to satisfy the required upper division business elective, the ECON/A ST elective, and electives in the major.

The only courses that may be taken on an S/U option by students in the College of Business are those designated S/U only, general electives outside the college, and up to 9 credits of HON courses used to fulfill General Education requirements.

Before taking upper-division courses (numbered 300 or above) offered by the College of Business, students must complete all lower-division course requirements with the required minimum grades or better.

Business course credits completed more than ten years prior to the degree application will be reviewed by the course department head and dean (or a designee) to determine their continued suitability to satisfy current degree, major and minor requirements and learning objectives.

## Course Requirements

General Education Requirements 35

Students are advised to take ENGL 203G as their second writing course and ECON 251G and ECON 252G to satisfy the social and behavioral science category.

Grades of C- or better are required in general education communications courses.

Foundation Requirements <sup>1</sup>		
MATH 121G	College Algebra	3
MATH 142G	Calculus for the Biological and Management Sciences (Majors in Economics and International Business must earn a grade of at least C-)	3
A ST 251G	Statistics for Business and the Behavioral Sciences	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
or A ST 311	Statistical Applications	
Business Core: Lower Division (minimum grades of C- required)		
ACCT 221	Principles of Accounting I (Financial) (not recommended for freshman year)	3
ACCT 222	Principles of Accounting II (Managerial)	3
BCIS 110	Fundamentals of Information Literacy and Systems	3
BUSA 111	Introduction to Business	3
ECON 251G	Principles of Macroeconomics (Credits are counted in general education)	3
ECON 252G	Principles of Microeconomics (Credits are counted in general education)	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
FIN 341	Financial Analysis and Markets	3
MGT 309	Human Behavior in Organizations	3
MGT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning <sup>2</sup>	3
or MGT 344	Production and Operations Management	
or MGT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, FIN, I B, MGT, MKTG (excluding A ST 311)		3
<b>Major Courses</b>		<b>24-27</b>
Viewing a Wider World		
Select 6 credits from Viewing a Wider World <sup>3</sup>		6
Select additional credits to bring total degree credits to a minimum of 120 and upper division credits to 48. The number of general elective credits varies by student and major.		
Total Credits		120

<sup>1</sup> Students may be required to take MATH 120, depending on their math placement. MATH 121G or MATH 142G or A ST 215G or STAT 251G fulfills the general education requirement in math.

<sup>2</sup> Management - Project Supply Change majors may not use MGT 470 Project Management in Organizations to satisfy this requirement since it is a requirement in the major; Accounting majors must take BCIS 485 Enterprise Resource Planning.

<sup>3</sup> A description of the requirement and a listing of approved VWW courses can be found in this catalog under Required Courses (p. 46).

## Associate in Prebusiness Degree

To complete the associate degree, 60 credits are required, including the General Education Requirements, College of Business Foundation and Business Core (lower division) requirements.

A minimum cumulative grade point average of 2.0 is also required. The last 15 credits towards the degree must be earned through the NMSU system.

Associate in Prebusiness (p. 428)

## Minors in Business

Minors are available in

- accounting,
- advertising,
- banking and financial planning,
- business administration,
- business law,
- economics,
- enterprise systems,
- entrepreneurship and innovation,
- finance,
- information systems,
- international business,
- management,
- marketing,
- professional selling,
- risk management and insurance,
- sports marketing, and
- sustainability.

Students pursuing the Bachelor of Individualized Studies or the Bachelor of Applied Studies are not eligible for minors from the College of Business other than the minor in business administration. At least 12 credits of the minor must be completed at the NMSU College of Business.

## Prelaw Students

Because the practice of law often involves business-related problems, the majors in the college provide an excellent preparation for the prelaw student. The college has attorneys on the faculty who are available as advisors. Please contact the Finance Department for more information.

## Undergraduate Minor: Business Administration

This minor is available to all bachelors degree seeking students, except those seeking the *Bachelor of Accountancy* and the *Bachelor of Business Administration* degrees. It is the only minor in Business open to students in the Bachelor of Applied Studies and the Bachelor of Interdisciplinary Studies. At least 12 of the credits for the minor must be completed in the NMSU College of Business.

## Minor Requirements

Choose 18 credits of coursework from these business core courses: Nine of the credits must be at the upper division level.

### Lower Division

ACCT 221	Principles of Accounting I (Financial) <sup>1</sup>
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ACCT 222	Principles of Accounting II (Managerial) <sup>1</sup>
BCIS 110	Fundamentals of Information Literacy and Systems
BUSA 111	Introduction to Business
ECON 251G	Principles of Macroeconomics <sup>1</sup>
ECON 252G	Principles of Microeconomics
<i>Upper Division</i>	
BCIS 338	Business Information Systems I
BLAW 316	Legal Environment of Business
FIN 341	Financial Analysis and Markets <sup>1</sup>
MGT 309	Human Behavior in Organizations
MKTG 303	Principles of Marketing <sup>1</sup>
MGT 344	Production and Operations Management <sup>2</sup>
or MGT 470	Project Management in Organizations
or BCIS 485	Enterprise Resource Planning

<sup>1</sup> Courses satisfy background knowledge requirements for the MBA program when completed with a B- grade or better.

<sup>2</sup> Only one course may be applied to this minor.

*Notes: At least 9 of the 18 credits for the minor must be upper division and at least 12 of the 18 credits must be completed at NMSU. A minimum GPA of 2.0 is required in the coursework for the minor.*

*Several courses listed above have prerequisites. It is the responsibility of the student to determine course prerequisites and other registration requirements.*

## Transferring Business Courses

The following business courses have been identified as transferable from NMSU to other public two year and four year institutions in New Mexico. The equivalent course at other institutions can be identified using the common course number which appears in parentheses below. Similarly, students from other institutions can use the common course number to identify business courses that can be transferred to NMSU.

A ST 251G	Statistics for Business and the Behavioral Sciences (MATH 2313)	3
STAT 251G	Statistics for Business and the Behavioral Sciences (MATH 2313)	3
ACCT 221	Principles of Accounting I (Financial) (ACCT 2113)	3
ACCT 222	Principles of Accounting II (Managerial) (ACCT 2123)	3
BCIS 110	Fundamentals of Information Literacy and Systems (BCIS 1113)	3
BLAW 418	Uniforms Commercial Code and Advanced Business Law Topics <sup>1</sup>	3
BMGT 231	Legal Issues in Business (BLAW 2113)	3
BUSA 111	Introduction to Business (BUSA 1113)	3
ECON 251G	Principles of Macroeconomics (ECON 2113)	3
ECON 252G	Principles of Microeconomics (ECON 2123)	3
FIN 206	Introduction to Finance (FIN 2113) <sup>1</sup>	3
MGT 201	Introduction to Management <sup>1</sup>	3

BMGT 210 Marketing (MKTG 2113)

<sup>1</sup> Count as general electives in the College of Business.

## Bachelors Degrees

Bachelor of Accountancy (p. 433)

Bachelor of Arts in Economics (p. 446)

### Bachelor of Business Administration

#### Majors in:

- Economics (p. 446)
- Finance (p. 453)
- General Business (p. 459)
- Information Systems (p. 433)
- International Business (p. 447)
- Management (p. 459)
- Marketing (p. 463)

## Masters Degrees

Master of Accountancy (p. 434)

Master of Science - Applied Statistics (p. 448)

### Master of Business Administration - Business Administration

- Agribusiness
- Finance
- Information Systems

Master of Arts - Economics (p. 448) (Public Utility Policy and Regulation)

## Graduate Certificates

Graduate Certificates - Public Utility Regulations and Economics (p. 450)

Graduate Certificates - Finance (p. 456)

## Dual Degrees

BS in Engineering/Master of Business Administration (p. 439)

## Doctoral Degrees

### Doctor of Philosophy - Business Administration

- Management (p. 439)
- Marketing (p. 439)

### Doctor of Economic Development - Economics

## Undergraduate Minors

- Accounting (p. 433)
- Advertising (p. 464)
- Business Administration (p. 428)
- Business Law (p. 454)
- Economics (p. 447)
- Entrepreneurship and Innovation (p. 455)

- 3 • Enterprise Systems (p. 434)
- Finance (p. 455)
- Information Systems (p. 434)
- International Business (p. 447)
- Management (p. 460)
- Marketing (p. 464)
- Professional Selling (p. 464)
- Risk Management and Insurance (p. 455)
- Sports Marketing (p. 464)
- Sustainability (p. 460)

## Graduate Minors

- Applied Statistics (p. 450)
- Economics (p. 450)
- Information Systems (p. 435)

## Accreditation

New Mexico State University has been accredited since 1926 by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools as a degree-granting institution. The university was accredited in 1954 by the American Association of University Women.

The baccalaureate and graduate degree programs in business and accounting offered in the College of Business are accredited by AACSB International—The Association to Advance Collegiate Schools of Business.

## Accounting and Information Systems Undergraduate Program Information

The Bachelor of Accountancy degree is available to students choosing accounting as a major. The curriculum is designed to prepare you for the excellent opportunities that exist in public accounting practice and in business, government and nonprofit organizations. It is also appropriate for those who may choose to seek either the Master of Accountancy or the Master of Business Administration degree after graduation.

The Information Systems program has a focus on cyber security that prepares you for a variety of administrative and technical positions associated with the security of information systems. Potential employers include information system service organizations, public accounting/consulting firms, manufacturing and merchandising business, banks and other financial institutions, government and others that rely on information systems to support their business.

## Graduate Program Information

The last two decades have witnessed a tremendous expansion in the knowledge base required for accounting professionals. The business environment has become increasingly complex, as evidenced by the growth in the body of national and international accounting and auditing standards, taxation, SEC and other regulatory requirements. The accountant must also be well versed in communications and analytical skills, computer-based information systems, professional ethics and global issues.

Neither the traditional four-year accounting program nor the MBA provides the educational breadth and depth necessary to fully prepare

students for the demands now imposed by many accounting careers. The major objective of the Master of Accountancy (MAcc) program is to provide for these increased educational needs and to prepare students more adequately for careers as professional accountants in financial institutions, government, not-for-profit organizations and public practice. The program is designed to provide a technical and theoretical foundation in accountancy at the advanced level and yet allow the student to take courses to accommodate individual needs.

## Degrees for the Department

Accounting - Bachelor of Accountancy (p. 433)

Information Systems - Bachelor of Business Administration (p. 433)

Accounting - Master of Accountancy (p. 434)

## Minors for the Department

Accounting - Undergraduate Minor (p. 433)

Enterprise Systems - Undergraduate Minor (p. 434)

Information Systems - Undergraduate Minor (p. 434)

Information Systems - Graduate Minor (p. 435)

### Professor, Larry Tunnell, Department Head

**Professors** Mora, Oliver, Seipel, Tunnell; **Associate Professors** Billiot, Melendrez, Nelson, Clemons; **Assistant Professors** Arslan, Ewing, Joo, Zhang; **College Associate Professor** Spencer; **College Assistant Professor** Hamilton, Shindi, Taylor; **Emeritus Professor** Foster, Kreie, Mills, Scribner

*Larry Tunnell, Department Head, Ph.D. (Oklahoma State) C.P.A. - taxation; F. Arslan, Ph.D. (U of Texas - El Paso); M. J. Billiot, D.B.A. (Mississippi State) C.P.A.-managerial and financial accounting; R. Clemons, Ph.D. (Texas A&M) C.P.A. - taxation; R. Ewing, Ph.D. (Kentucky) C.P.A., C.M.A. - managerial accounting; T. Foster (emeritus), Ph.D. (Penn State) - financial accounting; T. Joo, Ph.D. (Arkansas) financial accounting and taxation; K. Melendrez, Ph.D. (Arizona) - financial accounting; S. K. Mills (emeritus), Ph.D. (Texas Tech) C.P.A.-managerial accounting and fraud examination; E.A. Scribner (emeritus), Ph.D. (Oklahoma State)- C.P.A. financial accounting and accounting systems; C. Seipel, Ph.D. (Oklahoma State)- C.P.A., C.F.E.-financial accounting and auditing; Y. Zhang, Ph.D. (Texas Tech) - financial accounting.*

## Accounting Courses

### ACCT 101. Supplemental Instruction to ACCT 221

#### 1 Credit

Collaborative workshop for students in ACCT 221 – Financial Accounting. Course does not count toward departmental degree requirements. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**Corequisite(s):** ACCT 221.

### ACCT 200. A Survey of Accounting

#### 3 Credits

Emphasis on financial statement interpretation and development of accounting information for management. For engineering, computer science, and other non business majors. Community Colleges only.

**Prerequisite:** one C S course or consent of instructor.

### ACCT 221. Principles of Accounting I (Financial)

#### 3 Credits

An introduction to financial accounting concepts emphasizing the analysis of business transactions in accordance with generally accepted accounting principles (GAAP), the effect of these transactions on the financial statements, financial analysis, and the interrelationships of the financial statements.

### ACCT 222. Principles of Accounting II (Managerial)

#### 3 Credits

An introduction to the use of accounting information in the management decision making processes of planning, implementing, and controlling business activities. In addition, the course will discuss the accumulation and classification of costs as well as demonstrate the difference between costing systems.

**Prerequisite(s):** ACCT 221.

### ACCT 301. Financial Accounting I

#### 3 Credits

Concepts, principles, and practices of financial accounting, stressing the determination of income and financial position. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

**Prerequisite(s):** C or better in ACCT 221 and ACCT 222.

### ACCT 302. Financial Accounting II

#### 3 Credits

A continuation of ACCT 301.

**Prerequisite(s):** C- or better in ACCT 301.

### ACCT 351. Accounting Systems

#### 3 Credits

Covers accounting information systems as processors of data for financial reporting and control of economic organizations.

**Prerequisite(s):** ACCT 221 and ACCT 222.

### ACCT 353. Cost Accounting

#### 3 Credits

The development and use of cost accounting information for inventory valuation, income determination, and cost control. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

**Prerequisite(s):** C or better in both ACCT 221 and ACCT 222.

### ACCT 403. Federal Taxation I

#### 3 Credits

Basic federal income tax laws; emphasis on determination of taxable income of individuals. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

**Prerequisite(s):** A "C" or better in ACCT 221 and ACCT 222.

### ACCT 451. Auditing Theory and Practices

#### 3 Credits

Auditing standards, audit evidence, auditors reports and opinions, and professional responsibilities.

**Prerequisite(s):** ACCT 351 and C- or better in ACCT 302.

### ACCT 455. Federal Taxation II

#### 3 Credits

Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning.

**Prerequisite(s):** C- or better in ACCT 403 or consent of instructor.

**ACCT 456. Accounting for Nonprofit Organizations****3 Credits**

Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports.

**Prerequisite(s):** C- or better in ACCT 302.

**ACCT 460. Fraud Examination and Prevention****3 Credits**

Covers business fraud as it is occurring in American society. Emphasis is on occupational fraud and financial statement fraud. Examines various types of fraud, its symptoms and effective investigation techniques. Effective fraud prevention measures are discussed throughout the course. Emphasizes case studies and the application of principles to actual fraud cases.

**Prerequisites:** a C- or better in ACCT 451 or concurrent enrollment.

**ACCT 490. Selected Topics****1-3 Credits**

Current topics in accounting. Prerequisites vary according to the seminar offered. May be repeated for a maximum of 12 credits under different subtitles.

**ACCT 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ACCT 500. Concepts in Accounting****1 Credit**

Development, interpretation, and use of accounting information for financing, investing, operating, and managerial decision making.

**Prerequisite(s):** Admitted to MBA program.

**ACCT 503. Accounting for Managers****3 Credits**

Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to MAcc students.

**Prerequisite(s):** B or better in both ACCT 221 and ACCT 222.

**ACCT 510. Technical and Professional Communication for Accountants****3 Credits**

Effective writing strategies for professional communications. Students will learn to write with a professional style and proper English usage and to work with a variety of technical and lay audiences. Emphasis on initiation, planning, composition, and evaluation of business and accounting workplace scenarios to develop communication skills used in a business environment. Restricted to: Master of Accountancy majors.

**ACCT 525. Advanced Cost-Managerial Accounting****3 Credits**

Advanced cost-managerial concepts with a quantitative emphasis. Integrates cost-managerial concepts, quantitative tools, organization theory, behavioral concepts and computer methodology. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 353.

**ACCT 530. Advanced Accounting****3 Credits**

This course is designed to provide in-depth study of current financial accounting concepts related to business combinations, financial statement consolidations, and foreign currency transactions and translations. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 302 with a grade of C or better.

**ACCT 544. Financial Statement Analysis and Valuation****3 Credits**

Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** Acct 302; Graduate students only.

**ACCT 550. Special Topics****3 Credits**

Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting.

Prerequisites vary according to topic being offered.

**ACCT 551. Advanced Auditing Theory and Practice****3 Credits**

Understanding and evaluating internal control in an EDP environment.

Statistical sampling applications and current issues in auditing.

Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 451.

**ACCT 554. Accounting Theory****3 Credits**

Contemporary theoretical basis of accounting. An in-depth study of generally accepted accounting principles and current issues in accounting. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 302.

**ACCT 555. Federal Tax Research****3 Credits**

Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 403.

**ACCT 559. Ethics and Professionalism in Accounting****3 Credits**

Introduction to ethical reasoning, integrity, objectivity, independence, and professional accounting issues. Students will apply the concepts and theories to accounting-specific cases. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** C or better in ACCT 451.

**ACCT 560. Taxation of Corporations and Shareholders Advanced****3 Credits**

Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 403.

**ACCT 564. Financial Accounting Research****3 Credits**

Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of Instructor required. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 302.

**ACCT 570. Taxation of Partnerships****3 Credits**

Taxation of partnership contributions and distributions, transfer of partnership interests, and allocations of partnership income. Also includes taxation of S corporations. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 403.

**ACCT 580. Professional Accountancy****3 Credits**

Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Restricted to: Master of Accountancy majors.

**ACCT 598. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisite:** consent of instructor.

**ACCT 599. Master's Thesis****15 Credits**

Thesis.

**Department of Accounting and Information Systems**

**Business Complex, Suite 232**

**Phone: (575) 646-4901, Fax: (575) 646-1552**

**Website:** <https://business.nmsu.edu/departments/accounting/>

## Accounting - Bachelor of Accountancy

Every candidate for the Bachelor of Accountancy degree must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core courses, Viewing a Wider World requirements and general electives. Please see the College of Business (p. 428) section for these requirements

### Requirements

These requirements combined with the accounting courses required as part of the business core courses provide a minimum of 30 credits in accounting.

**Major Courses**

ACCT 301	Financial Accounting I <sup>1</sup>	3
ACCT 302	Financial Accounting II	3
ACCT 351	Accounting Systems	3
ACCT 353	Cost Accounting <sup>1</sup>	3
ACCT 403	Federal Taxation I <sup>1</sup>	3
ACCT 451	Auditing Theory and Practices	3
Elective in business, upper-division		3
Electives in accounting, upper-division		6
<b>Total Credits</b>		<b>27</b>

<sup>1</sup> A student who does not pass ACCT 301 Financial Accounting I, ACCT 353 Cost Accounting, or ACCT 403 Federal Taxation I within three attempts will not be allowed to take the class for a fourth.

In order to count toward the Bachelor of Accountancy, upper-division transfer courses in accounting

1. must have been taken at an institution with AACSB Accounting accreditation or
2. be part of the New Mexico Business Articulation Matrix.

## Information Systems - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and business core (p. 428), Viewing a Wider World requirements and general electives.

IS majors must take the following, for a total of 24 credits:

**REQUIRED COURSES**

BCIS 350	Information Systems Analysis and Design	3
BCIS 475	Database Management Systems	3
BCIS 482	Management of Information Security	3
<b>Select fifteen additional credits (five classes) from the following:</b>		<b>15</b>
ICT 377	Computer Networking I	3
ICT 477	Computer Networking II	3
ICT 339	Introduction to Digital Forensics and Incident Response	3
C S 453	Python Programming I	3
BCIS 461	Business Analytics I	3
BCIS 466	Business Analytics II	3
BCIS 480	E-Commerce Security	3
BCIS 490	Selected Topics	1-3
<b>Total Credits</b>		<b>24</b>

Please note that some of the courses listed may have a prerequisite which would require a student to take an additional course. Substitutions for some of these courses may be considered if a student makes this request to the department.

## Accounting - Undergraduate Minor

To obtain a minor in Accounting, a student must complete 18 or more credit hours of approved course work in Accounting (ACCT), of which at least 12 hours are in courses numbered 300, or higher. All courses for the minor must be completed with a grade of C- or better. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

**Required Courses**

ACCT 221	Principles of Accounting I (Financial)	3
ACCT 222	Principles of Accounting II (Managerial)	3
ACCT 301	Financial Accounting I	3
<b>Select three from the following:</b>		<b>9</b>
ACCT 302	Financial Accounting II	
ACCT 351	Accounting Systems	
ACCT 353	Cost Accounting	
ACCT 403	Federal Taxation I	

ACCT 451	Auditing Theory and Practices	
ACCT 455	Federal Taxation II	
ACCT 456	Accounting for Nonprofit Organizations	
ACCT 460	Fraud Examination and Prevention	
BCIS 485	Enterprise Resource Planning	
Total Credits		18

Of the 12 hours of upper-division Accounting classes required for the minor, a minimum of 6 must be taken at NMSU. At least 12 credit hours must be completed at the NMSU College of Business. To count toward the minor, upper-division transfer courses must have been taken at an institution with AACSB Accounting accreditation.

## Enterprise Systems - Undergraduate Minor

To obtain a minor in Enterprise Systems, a student must complete 18 or more credit hours of approved course work. A cumulative grade point average of at least 2.0 over the 18 hours must be earned. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

### Required Courses

ACCT 351	Accounting Systems	3
BCIS 485	Enterprise Resource Planning	3
BCIS 482	Management of Information Security	3
FIN 360	Financial Information Technology	3
Select one from the following:		3
MGT 351	Supply Chain Management	
MGT 344	Production and Operations Management	
MGT 466	Managing Electronic Commerce: A Business Models Perspective	
Select one from the following:		3
ACCT 353	Cost Accounting	
MGT 345V	Quality and Competitiveness: An International Perspective	
MGT 470	Project Management in Organizations	
I B 458	Comparative International Management	
FIN 475	International Managerial Finance	
Total Credits		18

## Information Systems - Undergraduate Minor

To obtain a minor in Information Systems (IS), a student must complete 18 or more credit hours of approved coursework in IS, of which at least 12 hours are in courses numbered 300 or higher. A cumulative grade point average of at least 2.0 over the 18 hours must be earned. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

### Required Courses

BCIS 338	Business Information Systems I	3
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BCIS 350	Information Systems Analysis and Design	3
BCIS 482	Management of Information Security	3
Select 9 credits from the following:		9
ACCT 351	Accounting Systems	
BCIS 475	Database Management Systems	
BCIS 480	E-Commerce Security	
BCIS 485	Enterprise Resource Planning	
BCIS 490	Selected Topics	
Total Credits		18

## Accounting - Master of Accountancy

The MAcc program is recommended for those students wishing to fulfill the 150-hour education requirement which most states, including New Mexico, have legislated as a requirement for taking the Uniform CPA Examination.

Graduate assistantships are available for a limited number of qualified students. Interested persons are urged to apply well within the deadlines set by the Graduate School. Inquiries should be addressed to the Director.

Admission requirements of the Graduate School must be met before the applicant may be admitted to the Master of Accountancy program. Consideration for admission to the Master of Accountancy program is dependent on an applicant's undergraduate record and score on the Graduate Management Admissions Test (GMAT). Specifically, an applicant's undergraduate GPA is multiplied by a factor of 200 and the result is added to his/her GMAT score. The required total is 1100. Applicants scoring between 1000 and 1100 will be admitted to the program only with approval of the MAcc Admissions Committee. The minimum acceptable GMAT score is 400. An acceptable score on the GMAT should be submitted at least one month prior to the student's first enrollment unless the student meets one of the GMAT waivers listed below.

In addition to the aforementioned entrance requirements, an applicant's GPA in 7 upper division accounting prerequisites must be at least 3.0. For those students not receiving their undergraduate accounting degree at NMSU, it is expected that substantially all of the accounting prerequisite classes be from an AACSB accredited business school or the application will need to be approved by the MAcc Admissions Committee. In this case the Admissions Committee may require that some of these prerequisite courses be retaken at an AACSB institution such as NMSU.

All grades, including those from the first attempt at repeated classes, will be used to compute upper division accounting prerequisite grade point averages to determine admission to the graduate program. At the suggestion of any faculty member, the MAcc Admissions Committee will review the application of a student whose potential might not be accurately reflected by this calculation.

## GMAT Waivers

The GMAT requirement is waived for those who:

1. Are graduates of an undergraduate program in accounting from a US AACSB accredited business school with at least a 3.25 GPA overall and a 3.25 GPA in their eight upper division accounting courses; or
2. Are graduates of NMSU's undergraduate accounting program with at least a 3.25 GPA overall and a 3.0 GPA in six core upper division accounting classes; or

3. Hold a recognized professional accounting credential (such as CPA, CMA, CIA, CFE); or
4. Hold a post baccalaureate degree (such as MBA, MS, MA, JD) from an approved, AACSB-accredited US university with a minimum 3.0 GPA in graduate course work.

Candidates for the Master of Accountancy degree who have an undergraduate degree in accounting must successfully complete a minimum of 30 graduate credits. Qualifying NMSU undergraduate accounting students can apply to have two graduate courses count for their undergraduate program as well as their graduate program. Candidates with an undergraduate degree in a field other than accounting must complete additional prerequisite work dependent upon previous courses taken. In any case, all candidates must present or fulfill the following requirements:

## Foundation Courses

These courses are required of every student unless they can be waived. As a general policy, the courses upon which waivers are claimed must have been taken within seven years of enrollment in the program with a grade of B or better. A final decision regarding a waiver is based on an evaluation of each student's total educational and professional background.

(for a description of these courses, see the New Mexico State University Catalog)

### Foundation Courses

ACCT 221	Principles of Accounting I (Financial)	3
ACCT 222	Principles of Accounting II (Managerial)	3
BCIS 338	Business Information Systems I	3
BCIS 485	Enterprise Resource Planning	3
BLAW 316	Legal Environment of Business	3
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
FIN 341	Financial Analysis and Markets	3
MGT 309	Human Behavior in Organizations	3
MKTG 303	Principles of Marketing	3
A ST 251G	Statistics for Business and the Behavioral Sciences	3
or A ST 311	Statistical Applications	

Total Credits 33

## Accounting and Related Prerequisites (21 Credits)

In addition to the foundation requirements, each student must present or complete the equivalent of an undergraduate major in accounting. This requires, at a minimum, 21 credits of accounting above the elementary level.

No coursework applied toward the MAcc degree, including the foundation requirements and the undergraduate accounting prerequisites, may be taken on an S/U basis.

## Core and Other Courses (30 Credits)

### Core Courses

Each student must complete 21 credits in accounting courses numbered above 520. These courses must include a research class

(either ACCT 555 Federal Tax Research or ACCT 564 Financial Accounting Research) and Ethics in Accounting (ACCT 559 Ethics and Professionalism in Accounting) unless a student has already taken an equivalent course. In addition, three of the credits may be in upper division undergraduate elective accounting courses numbered 450 or higher. Other specific courses to be completed by each candidate will be determined in the advisement process.

### Other Courses

All students must complete a total of 9 additional credits in other courses. Three of the credits must be ACCT 510 Technical and Professional Communication for Accountants, and the rest must be from the approved list of electives or a waiver must be received to take a course not on the list. Neither ACCT 503 Accounting for Managers nor any course fulfilling the foundation requirement may be included. Any student wishing to be waived from any of the above requirements may submit a petition in writing to the MAcc Director. Each request will be considered individually by the MAcc Committee.

## General

The Graduate School requires that students maintain a grade-point average of at least 3.0 in all courses taken as a graduate student, as well as a 3.0 grade-point average in all graduate courses taken as a graduate student at NMSU. The Department of Accounting and Information Systems requires, in addition, that every candidate for the MAcc degree maintain at least a 3.0 grade-point average in all accounting courses used to satisfy the core and elective course requirement. MAcc students may not retake 500-level accounting courses for which they have previously received a grade without approval of the MAcc Admissions Committee.

## Comprehensive Examination

Satisfactory performance on an electronic portfolio is required for the degree.

**Thesis:** No thesis is required; however, under special approval, a candidate may elect to write a thesis under ACCT 599 Master's Thesis. Up to 6 credits may be earned for the thesis.

### Admission to Master of Accountancy

Class registration in any Accounting course numbered above ACCT 503 Accounting for Managers requires

1. prior full admission to the MAcc program, or
2. prior consent of the Director of the MAcc program.

## Information Systems - Graduate Minor

This minor is for master's-level students who are not in the Masters of Business Administration (MBA) program. Students in the MBA program may choose a concentration in Information Systems (see the Business Administration (p. 436) section).

To obtain a graduate minor in Information Systems (IS) students must satisfy the requirements as stated below for a minor at the master's level. For it to appear on the transcript, the student must list the minor on the Program of Study and Committee for Master's Student (Application for Admission to Candidacy) and have it signed by the head of the department offering the minor.

## Requirements

The minor requires a minimum of 9 credits of graduate work.

### Requirements

BCIS 550	Information Systems Analysis and Design	3
BCIS 575	Database Management Systems	3
Select 3 credits from the following:		3
BCIS 561	Business Analytics I	
BCIS 566	Business Analytics II	
BCIS 580	E-Commerce Security	
BCIS 582	Management of Information Security	
BCIS 585	Enterprise Resource Planning & Business Processes	
BCIS 590	Special Topics	
Total Credits		9

## Business Administration Graduate Program Information

The Master of Business Administration (MBA) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The business and accounting programs at NMSU, including the MBA program, are accredited by AACSB International - The Association to Advance Collegiate Schools of Business. The MBA program is offered in a traditional classroom with some online delivery and in a cohort-based distance program with a synchronous online component. Details are available at <http://business.nmsu.edu/mba>.

The Ph.D. program in Business Administration offers the opportunity to specialize in either Marketing or Management.

## Degrees for the Department

Business Administration - Master of Business Administration (p. 437)

Engineering/MBA Program – Dual Degree (p. 439)

Business Administration - Doctor of Philosophy (p. 439)

R. Adkisson, Ph.D. (Nebraska)– economic development, public finance, institutional economics; T. R. Adler, Ph.D. (Cincinnati)– policy and strategy, collaborative networks, information systems; P. G. Benson, Ph.D. (Colorado State)– international human resource management, wage and salary administration; M. J. Billiot, D.B.A. (Mississippi State, C.P.A.)– managerial accounting; J. W. Bishop, Ph.D. (Virginia Tech)– human resource management and organizational behavior; L. Blank, Ph.D. (Tennessee)– micro economics, economics of regulated utilities; D. M. Boje, Ph.D. (Illinois)– organizational behavior, storytelling, organizational change; K. Brook, Ph.D. (Texas)– money and banking, macroeconomic theory; G. Clarkson, J.D., D.B.A. (Harvard) - American Indian law, tribal economic development, intellectual property strategy, business law; R. Clemons, Ph.D. (Texas A&M) - C.P.A., taxation; N. H. Compton, J.D. (Emeritus); B.F. Daily, Ph.D. (Emeritus); D. L. Daniel, Ph.D. (Southern Methodist)– non parametrics; M.E. de Boyrie, Ph.D.

(Florida International)– international finance and trade issues; P. W. Dorfman, Ph.D. (Emeritus); C. E. Enomoto, Ph.D. (Texas A&M)– microeconomic theory; C. A. Erickson, Ph.D. (Arizona State)– monetary theory, macroeconomics; C. Flinchbaugh, Ph.D. (Kansas)– Organizational behavior, human resources; R. D. Fortin, Ph.D. (Kansas)– corporate finance and investments; C. Gard, Ph.D. (University of Washington)– biostatistics; D. A. Gegax, Ph.D. (Wyoming)– managerial economics, microeconomic theory; W. R. Gould, Ph.D. (North Carolina State)– biological sampling, wildlife and fisheries estimation; M. Holt, J.D. (University of New Mexico) - business law, employment law; M. Hyman, Ph.D. (Purdue)– marketing theory and research; I.M. Jasso, Ph.D. (Houston)– advertising, strategy; M. Jun, Ph.D. (Georgia State)– production and operations management; J. Kreie, Ph.D. (Arkansas)– information systems; L. LaPlue, Ph.D. (Tennessee) – international and environmental economics.; Y. F. Lee, Ph.D. (Southern Illinois-Carbondale)– international finance, international trade, international monetary system, economic development; J. Loveland, Ph.D. (Emeritus); K. J. Martin, Ph.D. (Purdue)– financial management, corporate control; R. McFerrin, Ph.D. (Texas A&M)– microeconomics, macroeconomics, economic history; J. T. McGuckin, Ph.D. (Emeritus); K. D. Melendrez, Ph.D. (Arizona)– financial accounting; S. K. Mills, Ph.D. (Emeritus); C. Mora-Monge, Ph.D. (Toledo)– supply chain management, information systems; J. A. Nelson, Ph.D. (Missouri)– information systems; M. Niculescu, Ph.D. (University of Cincinnati)– modeling consumer behavior; R. Oliver, Ph.D. (New Mexico State)– information systems; N. A. Oretskin, J.D. (Case Western School of Law)– contract law/negotiation; J. T. Peach, Ph.D. (Texas)– quantitative economics, economic development; R. T. Peterson (Emeritus); C. Plouffe, PhD (Western University, Ontario, Canada)- marketing; J. Tim Query, Ph.D. (Georgia)– insurance, finance, risk management; S. Rahman, Ph.D. (Texas-El Paso) - personal financial planning, financial analysis and markets; C. Ricketts, Ph.D. (Mississippi State)– labor, health, development; G. A. Rosile, Ph.D. (Pittsburgh)– narrative research, organizational studies; H. Sankaran, Ph.D. (Houston)– corporate finance, investments; E. T. Sautter, Ph.D. (Emeritus); E. A. Scribner, Ph.D. (Emeritus); C. Seipel, Ph.D. (Oklahoma State)– C.P.A.-financial accounting, auditing; W.L. Smith, Ph.D. (New Mexico State)– C.P.A.-taxation; C. Sroka, Ph.D. (Ohio State)–count data models; R. L. Steiner, Ph.D. (Oklahoma State)– likelihood methods, discrete distributions; J. E. Teich, Ph.D. (Emeritus) P. L. Tunnell, Ph.D. (Oklahoma State)– C.P.A.-taxation; D. M. VanLeeuwen, Ph.D. (Oregon State)– statistics; B. Widner, Ph.D. (Colorado State)– urban/regional, public finance, development; Y. Zhang, Ph.D. (Texas Tech) financial accounting

## Business Administration Courses

### B A 104. Introduction to Business

#### 3 Credits

Survey and integration of functions in business organizations within their social and economic environment. Community Colleges only.

### B A 105. Special Topics

#### 1-3 Credits

Current topics in business and economics.

### B A 202. Small Business Enterprise

#### 3 Credits

Appraisal of business functions within the framework of a small business organization.

**B A 291. Business Administration and Economics Internship and Cooperative Education I****1-3 Credits**

Introduction and applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience, and not by the work experience.

**B A 305. Leadership Training for COB Ambassadors****1 Credit**

Leadership development for volunteers serving as COB student ambassadors, focusing on COB undergraduate business degree programs, NMSU student services, public speaking and public relations.

**B A 391. Business Administration and Economics Internship and Cooperative Education II****1-3 Credits**

Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.

**B A 490. Selected Topics****3 Credits**

Prerequisites vary according to the seminar being offered.

**B A 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisite:** junior or above standing and consent of instructor.

**B A 500. Macroeconomic Essentials****1 Credit**

Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems. Restricted to: MBA Major majors majors.

**B A 501. Quantitative Tools for the MBA****1 Credit**

An overview of critical topics in math and statistics that will provide a quantitative foundation for students entering the Master of Business Administration program. Admission to the MBA program.

**B A 550. Special Topics****3 Credits**

Interdisciplinary seminar in selected current business topics.

**Prerequisite(s):** Prerequisites vary according to the seminar being offered.

**B A 590. Professional Paper/Presentation****3 Credits**

Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Restricted to: MBA majors.

**Prerequisite(s):** Minimum of 3.0 average in: ACCT 503, BLAW 502, FIN 503, and MKTG 503 or AEEC 551.

**B A 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 3 credits may be earned.

**Prerequisite:** consent of instructor.

**B A 599. Master's Thesis****15 Credits**

Thesis.

**Name:** College of Business MBA Program

**Office Location:** Guthrie Hall 114

**Phone:** (575) 646-8003

**Website:** <http://business.nmsu.edu/academicprograms>

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**Name:** College of Business Ph.D., Management

**Office Location:** Business Complex 220

**Phone** (575) 646-1201

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**Name:** College of Business, Ph.D., Marketing

**Office Location:** Business Complex 209

**Phone:** (575) 646-3341

## Business Administration - Master of Business Administration

The Master of Business Administration (MBA) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The business and accounting programs at NMSU, including the MBA program, are accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

The MBA program is offered in a traditional classroom with some online delivery and in a cohort-based distance program with a synchronous online component.

Details are available at <http://business.nmsu.edu/mba> (<http://business.nmsu.edu/mba>).

### Admissions

Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to the MBA program. To be considered for admission to the MBA program, applicants must have:

1. completed an undergraduate degree with a GPA of at least 3.5 from an institution with business accreditation by AACSB International or ACBSP, or
2. completed the Graduate Management Admission Test (GMAT) with a minimum score of 400 and a combined GMAT score and undergraduate GPA such that  $(\text{GPA} \times 200) + \text{GMAT}$  is greater than or equal to 1050, or

- received a graduate degree from a regionally accredited U.S. college or university, or
- completed at least four years of relevant, full-time, post-degree, professional work experience with an undergraduate GPA of at least 3.25 from an institution with business accreditation by AACSB International or ACBSP.

If required, official GMAT scores must be submitted to the MBA Program Office at least one month prior to initial enrollment in the program. Students may submit a GRE score which can be converted to a GMAT equivalent score for purposes of admission.

A maximum of 9 credit hours of the required MBA courses may be completed prior to the student's acceptance into the MBA degree program.

## Background Knowledge

Although the MBA program is designed to encourage participation by students with a variety of educational backgrounds, the curriculum is fast paced. As a consequence, a minimum level of background knowledge is expected of all entering students, and those who lack the necessary background in any of the knowledge areas will be required to make up their deficiencies early in the program. Students may complete no more than 9 credits of required MBA courses prior to completion of the background knowledge courses.

Background knowledge may be demonstrated by successful completion (with a grade of A or B) of undergraduate courses in managerial accounting, financial accounting, macroeconomics, finance, marketing, statistics and calculus. At NMSU, the relevant courses are

ACCT 221	Principles of Accounting I (Financial)	3
ACCT 222	Principles of Accounting II (Managerial)	3
ECON 251G	Principles of Macroeconomics	3
FIN 341	Financial Analysis and Markets	3
MKTG 303	Principles of Marketing	3
A ST 251G	Statistics for Business and the Behavioral Sciences	3
or STAT 251G	Statistics for Business and the Behavioral Sciences	
or A ST 311	Statistical Applications	
MATH 142G	Calculus for the Biological and Management Sciences	3

Knowledge of each of these subjects may also be demonstrated by completing examinations as designed by the College of Business or by completing intensive one-credit courses in the summer. For more information on intensive courses and examinations, contact the MBA Office.

## Program Requirements (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements. Eleven are required courses:

### Required Courses

ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
FIN 503	Financial Management	3
MGT 502	Operations Management	3

MGT 503	Organizational Behavior and Management Processes	3
MGT 512	Quantitative Analysis for Business Decisions	3
MGT 590	Strategic Management	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course <sup>1</sup>		3
Total Credits		36

<sup>1</sup> This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a grade point average of at least 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a 3.0 grade point average in all courses required for the basic MBA degree.

The following course sequencing requirements must be satisfied:

- B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, FIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
- MGT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

**Final Examination for the Degree:** Students may satisfy the Graduate School requirement for a final exam by completing the following courses with grades of B or better: ACCT 503 Accounting for Managers, BCIS 502 Business Information Systems, BLAW 502 Legal Environment of Business, ECON 503 Managerial Economics, FIN 503 Financial Management, MGT 502 Operations Management, and MKTG 503 Marketing Management. Students who do not meet the grade requirement in these seven courses will need to arrange an oral exam consistent with Graduate School regulations.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with a least 6 credit hours earned under B A 599 Master's Thesis in lieu of B A 590 Professional Paper/Presentation.

MBA students may elect to pursue one of several MBA specializations as described below.

## Concentration: Agribusiness

Students who want to specialize in Agribusiness must take the following set of five AEEC courses in substitution of five courses included in the above list of required MBA courses.

AEEC 511	Advanced Futures and Options Markets	3
AEEC 520	International Agricultural Trade Theory and Policy	3
AEEC 526	Global Food Supply Chain Management	3
AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3
Total Credits		15

The five AEEC courses collectively substitute for the following five required MBA courses:

ECON 503	Managerial Economics	3
MGT 502	Operations Management	3
MGT 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
Elective course (from the approved list)		3
Total Credits		15

Students in the concentration in Agribusiness who have not previously taken a course in Agricultural Policy will be required to take AEEC 545 Advanced Agricultural Policy prior to taking the five concentration courses.

## Concentration: Finance

MBA students who want to specialize in Finance must complete the following four Finance courses. These courses can be used as substitutes for MGT 512 and BA 590.

### Required Courses

FIN 535	Investment Concepts	3
FIN 545	Fixed Income Markets, Instruments and Derivatives	3
FIN 555	Derivative Markets and Securities	3
FIN 566	Advanced Financial Management	3
Total Credits		12

## Concentration: Information Systems

Students who want to specialize in Information Systems must take additional coursework beyond that required to complete the MBA degree program. BCIS 502 Business Information Systems is a required MBA course and a prerequisite for each of the courses in the concentration.

Any of these courses may also be used to fulfill the MBA elective requirement.

### Required Courses

Select four from the following:		12
BCIS 550	Information Systems Analysis and Design	
BCIS 575	Database Management Systems	
BCIS 580	E-Commerce Security	

BCIS 582	Management of Information Security	
BCIS 585	Enterprise Resource Planning & Business Processes	
Total Credits		12

Students are encouraged to seek advising from the MBA Office or the Information Systems faculty in making course selections.

## Concentration: Public Utility Regulation

The concentration in Public Utility Regulation consists of the following courses. One of these courses will serve as the elective in the MBA program and two of the courses will substitute for courses MGT 512 and B A 590 in the standard MBA program (because the learning objectives of the utility regulation courses meet the learning objectives of the two basic MBA courses).

### Required Courses

ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		12

## Engineering/MBA Program – Dual Degree

Highly motivated undergraduate engineering students who would like to apply their quantitative skills and technical expertise to the business environment should consider the dual degree program offered through the College of Engineering and the College of Business. Undergraduate students who are accepted into this program can, with full time enrollment and careful scheduling of their coursework, complete the MBA degree requirements in as little as one year beyond completion of the BS degree. Information regarding the dual degree program may be obtained from the College of Engineering or the MBA Program Office (GU 114).

## Business Administration - Doctor of Philosophy

### Concentration: Management

Phone: (575) 646-1201

<http://business.nmsu.edu/academics/graduate-programs/mgt-phd/>

The College of Business offers a program leading to a PhD in Business Administration with a concentration in Management. Our program meets the requirements of AACSB international by providing students with advanced management-related theoretical, research and applied knowledge and skills. We are committed to educating researchers, teachers, and scholars who will lead and shape business and organizational life in the decades to come. We prepare you to understand the complexities of business and its social and international contexts while you develop a specialized area of expertise. Our program is flexible in order to align programs of study with job opportunities and students'

interest areas. Research skills are developed through course work and mentoring relationships, as you will work with faculty to pursue joint research according to your interest and faculty members' expertise. Our faculty prepare students for academic research and teaching careers in managerial and organizational sciences; consulting careers with industrial, governmental, health, or educational institutions; or leadership careers in organizational management and administration.

## Concentration: Marketing

Phone: (575) 646-3341

<http://business.nmsu.edu/academics/graduate-programs/mktg-phd/>

The College offers a program leading to a Ph.D. degree. The faculty of the PhD Program in Business Administration is committed to training researchers and educators who will shape business scholarship, practice and pedagogy. The program emphasizes preparing candidates to understand the complexities of modern business while they develop a specialized area of expertise in marketing or management. The PhD in Business Administration provides graduates with the opportunity to pursue a variety of career paths within academia and within industry. Currently concentrations are offered in management and marketing, and each admits students independently.

## Program Requirements

- demonstrate competency in statistics and research methods;
- complete studies in a major field of concentration chosen from the departments of management or marketing in the College of Business;
- complete studies in a minor field of concentration or interest area that supports the student's research, teaching and/or career goals;
- pass qualifying and comprehensive exams; and
- complete and successfully defend a doctoral dissertation.

## Sustainability - Graduate Certificate

The Sustainability Graduate Certificate is open to students admitted to the Graduate School who have a GPA of 3.0 or higher. Completion of the certificate requires completion of each of the individual courses with a B or better.

The following courses are required and are expected to be taken in sequence:

B A 550	Special Topics	3
ANTH 538	Plants, Culture, and Sustainable Development	3
Approved elective		3
MGT 458	Comparative International Management <sup>1</sup>	3
Total Credits		12

<sup>1</sup> In MGT 548 graduate students conduct an environmental audit during a consulting project to a small business, or a public, or a non-profit organization. The project includes at least two interventions that improve the sustainability of the organization (such as energy savings, reduction of use of natural resources, development of more sustainable relation to the ecosystem, and so forth).

## Economics, Applied Statistics, and International Business

### Undergraduate Program Information

The Department of Economics, Applied Statistics, and International Business (EASIB) offers undergraduate degrees in two majors in the bachelor of business administration – one in economics and one in international business. The Department also offers a bachelor of arts in economics. Economics majors work in business, government, and the non-profit sector. The economics major is also a good choice for students who plan to attend graduate school in economics, law, business and other areas. International business is a good major for those interested in working in the international operations of a business or interested in working outside the United States..

### Graduate Program Information

#### Graduate Study in Economics

EASIB cooperates with the Department of Agricultural Economics and Agricultural Business in offering graduate programs in economics, agricultural economics and economic development. The programs are jointly administered by faculty from the two departments. The objective of the master's program is to prepare students for professional positions in business, government, or research institutions. Our master's degrees also are good preparation for those considering applying to a Ph.D. program. EASIB offers a Master of Arts in economics. There are three concentrations: regulatory economics, policy analysis, and econometrics. For more information on the Master of Science degree in agricultural economics, refer to the Agricultural Economics (p. 91) section in this catalog. The Doctor of Economic Development is a unique program that provides advanced training in applied economic development.

#### Graduate Study in Applied Statistics

A graduate degree administered directly by EASIB is the Master of Applied Statistics. This degree is designed to produce graduates proficient in current practices in statistics and able to enter directly into positions in industry, government or private business. After completing this degree, a person will have the skills needed to execute data analyses, design experiments, and design and analyze surveys.

#### Graduate Study in Business Administration

The Department of Economics, Applied Statistics, and International Business cooperates with other departments of the College of Business to offer a Master of Business Administration and a Ph.D. in Business Administration. Within the Ph.D. program, the department offers a minor area of study and provides statistics courses to support the doctoral program. More information about these programs is available in this catalog under College of Business.

## Degrees for the Department

Economics - Bachelor of Art in Economics (p. 446)

Economics - Bachelor of Business Administration (p. 446)

International Business - Bachelor of Business Administration (p. 447)

Applied Statistics - Master of Science (p. 448)

Economics - Master of Arts (p. 448)

Public Utility Regulation and Economics - Graduate Certificate (p. 450)

Economics - Doctor of Economic Development (p. 449)

## Minors for the Department

Economics - Undergraduate Minor (p. 447)

International Business - Undergraduate Minor (p. 447)

Applied Statistics - Graduate Minor (p. 450)

Economics - Graduate Minor (p. 450)

**Christopher A. Erickson, Interim Department Head**

**Department of Economics, Applied Statistics and International Business:**

**Professors** R. V. Adkisson, Ph.D. (Nebraska)–international economics, public finance, economic development; D. L. Daniel, Ph.D. (Southern Methodist)–nonparametrics; C. Enomoto, Ph.D. (Texas A&M)–econometrics, economic theory; C. A. Erickson, Ph.D. (Arizona State)–economic development, monetary theory, macroeconomics; D. A. Gegax, Ph.D. (Wyoming)–public utility economics, industrial organization; W. R. Gould, Ph.D. (North Carolina State)–biological sampling, wildlife and fisheries estimation; J. T. Peach, Ph.D. (Texas-Austin)–quantitative economics, border studies, economic development; R. L. Steiner, Ph.D. (Oklahoma State)–likelihood methods, discrete distributions; D. M. VanLeeuwen, Ph.D. (Oregon State)–statistics; **Associate Professors** L. Blank, Ph.D. (Tennessee, Knoxville)–microeconomic theory, managerial economics, regulatory economics; K. Brook, Ph.D. (Texas-Austin)–macroeconomic theory, monetary policy; Y. F. Lee, Ph.D. (Southern Illinois-Carbondale)–international finance, international trade, international system, economic development; R. McFerrin, Ph.D. (Texas A & M)–micro theory, principles and American economic history; B. Widner, Ph.D. (Colorado State)–urban/regional, public finance, development; **Assistant Professors** B. Bai, MS (New Mexico State)–applied statistics; C. Gard, Ph.D. (Washington)–biostatistics; K.R. Geisler, Ph.D. (Nevada)–regional, applied micro, environmental; L. LaPlue (Tennessee)–international and environmental economics; C. Ricketts, Ph.D. (Mississippi State)–labor, health, development; C. Sroka (Ohio State)–count data models; **Emeritus Faculty** D.L. Clason, Ph.D. (Kansas State); M. Ellis, Ph.D. (California-Riverside); B. N. Matta, Ph.D. (Texas at Austin); J. T. McGuckin, Ph.D. (Wisconsin-Madison); A.V. Popp, Ph.D., (Northern Illinois); D.B. Smith, Ph.D., E. S. Willman, Ph.D. (Indiana)

## Applied Statistics Courses

**A ST 251G. Statistics for Business and the Behavioral Sciences**

**3 Credits**

Techniques for describing and analyzing data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. Same as STAT 251G.

**Prerequisite:** C- or better in MATH 120.

**A ST 311. Statistical Applications**

**3 Credits**

Techniques for describing and analyzing economic and biological data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference.

**Prerequisite(s):** MATH 120.

**A ST 450. Special Topics**

**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**A ST 456. Statistical Methods and Data Analysis**

**3 Credits**

Methods for sampling and estimation; analysis of variance and elementary experimental designs; linear regression and correlation; multiple regression, variable selection methods and residual analysis; introduction to statistical packages.

**Prerequisite(s):** A ST 251, A ST 311, or equivalent.

**A ST 498. Independent Study**

**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.

**A ST 503. SAS Basics**

**2 Credits (1+2P)**

An introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily PC/SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures.

**Corequisite(s):** A ST 505, or consent of instructor.

**A ST 504. Statistical Software Applications**

**1 Credit**

Optional Computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506.

**Prerequisite(s):** A ST 503 or consent of instructor.

**Corequisite(s):** A ST 506.

**A ST 505. Statistical Inference I**

**4 Credits (3+2P)**

A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z, t, x<sup>2</sup>, F), estimation, and testing. One-way analysis of variance. Simple linear regression.

**Prerequisite:** consent of the instructor.

**A ST 506. Statistical Inference II**

**3 Credits (2+2P)**

Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots.

**Prerequisite:** A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.

**A ST 507. Advanced Regression**

**3 Credits**

Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models.

**Prerequisites:** A ST 503 and A ST 505 or consent of instructor.

**A ST 508. Analysis of Advanced Designs and Related Topics**

**3 Credits**

Complete and incomplete block designs; fixed, mixed, and random models; unbalanced data; analysis of covariance; nested experiments; fractional factorials.

**Prerequisite(s):** A ST 503 and A ST 506; or consent of instructor.

**A ST 515. Statistical Analysis with R****3 Credits**

Introduction to R data types, basic calculations and programming, data input and manipulation, one and two sample tests, ANOVA, regression, diagnostics, graphics, probability distributions, and basic simulations in the R software environment.

**Prerequisite(s):** A ST 505 or equivalent with consent of instructor.

**A ST 521. Sampling Methodology****3 Credits (3+2P)**

Methodology of sampling finite populations using design-based (simple random, stratified, systematic, cluster, and multistage), model-based (regression and ratio estimators), and adaptive sampling. Properties of estimators under all designs are discussed.

**Prerequisite(s):** Either A ST 505 or A ST 565, or consent of instructor.

**A ST 523. Biological Sampling (s)****3 Credits**

Methods of sampling biological populations: area frame, quadrant, line intercept, line transect, and mark-recapture. May be repeated up to 3 credits.

**Prerequisite(s):** A ST 505 or consent of instructor.

**A ST 545. Time Series Analysis and Applications****3 Credits**

A systematic exposition of the methods for analyzing, modeling, and forecasting time series. Emphasizes underlying ideas and methods rather than detailed mathematical derivations, using SAS, BMDP, IMSL, and Fortran. May be repeated up to 3 credits.

**Prerequisite(s):** A ST 503 and A ST 505, or consent of instructor.

**A ST 550. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**A ST 551. Introduction to Statistical Consulting****1 Credit**

Consideration of published material in the consulting process. Restricted to majors. Graded S/U.

**Prerequisite:** consent of instructor.

**A ST 552. Advanced Statistical Consulting****1 Credit**

Continuation of A ST 551 with emphasis on dealing with clients in order to identify statistically relevant features of a research study. Restricted to majors. Graded S/U.

**Prerequisite:** A ST 551.

**A ST 553. Practicum in Statistical Consulting****1 Credit**

Supervised experience under the guidance of senior faculty. May be repeated for a maximum of 2 credits. Restricted to majors. Graded S/U.

**Prerequisite:** A ST 552.

**A ST 555. Applied Multivariate Analysis****3 Credits**

Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques.

**Prerequisite(s):** A ST 506 and A ST 504 or consent of instructor.

**A ST 565. Statistical Analysis I****4 Credits (3+2P)**

An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions ( $z$ ,  $t$ ,  $x^2$ ,  $F$ ), estimation, testing, and simulation.

**Prerequisite:** MATH 291G or consent of instructor.

**A ST 566. Statistical Analysis II****4 Credits (3+2P)**

Continuation of A ST 565.

**Prerequisite:** A ST 565 or consent of instructor.

**A ST 567. Applied Linear Models I****3 Credits**

The mean model, including constraints, approach to linear models; nonidentity variance-covariance matrices. Some emphasis on computational aspects and relation to statistical packages.

**Prerequisite:** A ST 566 or consent of instructor.

**A ST 568. Applied Linear Models II****3 Credits**

The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects.

**Prerequisite:** A ST 567.

**A ST 596. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval by department head. May be repeated for a maximum of 3 credits.

**Prerequisite:** consent of instructor.

**A ST 598. Special Research Problems****1-6 Credits**

Individual analytical or experimental projects. Restricted to majors. Graded S/U.

**A ST 599. Master's Thesis****1-6 Credits**

Thesis.

## Economics Courses

**ECON 201G. Introduction to Economics****3 Credits**

Economic institutions and current issues with special emphasis on the American economy.

**ECON 251G. Principles of Macroeconomics****3 Credits**

Macroeconomic theory and public policy: national income concepts, unemployment, inflation, economic growth, and international payment problems.

**ECON 252G. Principles of Microeconomics****3 Credits**

Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions.

**ECON 304. Money and Banking****3 Credits**

Income measurement and determination, monetary and fiscal policies.

**Prerequisite:** ECON 251G or equivalent, or consent of instructor.

**ECON 311. Intermediate Macroeconomic Theory****3 Credits**

Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.

**Prerequisite(s):** ECON 251G or equivalent.

**ECON 312. Intermediate Microeconomic Theory****3 Credits**

Contemporary economic theory with emphasis upon value and distribution.

**Prerequisite(s):** ECON 252G or equivalent.

**ECON 324V. Developing Nations****3 Credits**

Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

**ECON 325V. Economic Development of Latin America****3 Credits**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems.

**ECON 332. Public Finance****3 Credits**

This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 252

**ECON 335V. Business and Government****3 Credits**

Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGT 335G

**ECON 336. Labor Economics****3 Credits**

This course aims at developing students' understanding of how the labor market works. Topics to be covered include: labor supply and demand, wage differentials, wage structure, unemployment, gender issues, labor market discrimination, and migration.

**Prerequisite(s):** ECON 252G.

**ECON 337V. Natural Resource Economics****3 Credits**

Same as AG E 337V.

**Prerequisite:** ECON 201 or ECON 252.

**ECON 340. American Economic History****3 Credits**

The rise of big business and organized labor, increasing price rigidities, and growing government intervention. Same as HIST 340.

**ECON 384V. Water Resource Economics****3 Credits**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AG E 384V.

**Prerequisite:** AG E 100 or ECON 252G.

**ECON 401. Managerial Economics****3 Credits**

Application of economic theory to problems of business management.

**Prerequisite(s):** ECON 252G and MATH 142 or equivalent, or consent of instructor.

**ECON 404. Collegiate Advisory Board, Federal Reserve****3 Credits**

Students serve on the Collegiate Advisory Board of the El Paso branch of the Federal Reserve Bank of Dallas. Guest speakers provide an overview of the Federal Reserve System, role of monetary policy, and issues facing specific industries in the local, national, and global economies. Students prepare reports, including a final paper, on an assigned industry in the regional or state economy and the current economic performance of their industry. Students must be of junior rank or higher with a GPA of at least 3.5. Consent of Instructor required.

**ECON 405. Introductory Econometrics****3 Credits**

Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.

**Prerequisite(s):** A ST 251G or STAT 251G or A ST 311 (or equivalent).

**ECON 406. The Economics of Sports****3 Credits**

Applying the tools of economic analysis to a particular industry and gaining an in-depth knowledge of the interaction of professional sports teams and leagues with the economy and society. Same as AG E 406.

**Prerequisites:** one previous course in economics or consent of instructor.

**ECON 432V. Economics of Health Care****3 Credits**

Analysis of the allocation of resources in the field of health and medical care.

**ECON 449. Open Economy Macroeconomics****3 Credits**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.

**Prerequisite(s):** FIN 341 OR ECON 311.

**ECON 450. International Economics****3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450

**Prerequisite(s):** ECON 251G and ECON 252G.

**ECON 457. Mathematical Economics****3 Credits**

Application of mathematical tools, especially the calculus, to economic theory.

**Prerequisite:** one upper-division economics course.

**ECON 489. Senior Economics Seminar****3 Credits**

Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics.

**Prerequisite(s):** ECON 311 or ECON 312.

**ECON 490. Selected Topics****1-3 Credits**

Current topics in economics. Subject matter to be designated for each semester.

**ECON 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.

**Prerequisite:** junior or above standing and consent of instructor.

**ECON 503. Managerial Economics****3 Credits**

Theory and application of microeconomics to the management of organizations.

**Prerequisite(s):** A ST 251G or 311 or equivalent with B or better.

**ECON 545. Econometrics II****3 Credits**

Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

**Prerequisite(s):** ECON 251G, ECON 252G, STAT 251G or A ST 311, and AEEC 540.

**ECON 550. Special Topics****1-3 Credits**

Seminars in selected current topics in the various areas of economics.

Prerequisites vary according to the topic being offered.

**ECON 571. Regulatory Policy and Industry Analysis: Electricity I****3 Credits**

Regulatory policy and economic analysis related to the Electric Industry.

Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

**Prerequisite(s):** .

**ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas****3 Credits**

Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

**ECON 573. Regulatory Policy and Industry Analysis: Electricity II****3 Credits**

Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.

**Prerequisite(s):** ECON 571 or consent of instructor.

**ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis****3 Credits**

Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.

**Prerequisite(s):** ECON 571 or consent of instructor.

**ECON 581. International Economics****3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations.

**Prerequisite(s):** ECON 311 and ECON 312.

**ECON 582. Economics of Health Care****3 Credits**

Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.

**ECON 596. Independent Study****3 Credits**

Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

## Economic Development Courses

**ECDV 550. Introduction to Local and Regional Development****3 Credits**

Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.

**ECDV 590. Special Topics****1-3 Credits (1-3)**

Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.

**ECDV 596. Individual Study****1-3 Credits (1-3)**

Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.

**ECDV 651. Economic Development Theory****3 Credits**

Builds upon a general understanding of microeconomic and macroeconomic theory to focus specifically on theories of economic development at all levels. Prerequisites: AEEC 501 and 502

**ECDV 661. Regional Economic Modeling I****3 Credits**

Provides an introduction to the basic tools and methods of regional economic development analysis.

**Prerequisite(s):** AEEC 501, AEEC 502, and AEEC 540.

**ECDV 662. Regional Economic Modeling II****3 Credits**

Continuation of ECDV 661 with focus on more advanced tools and methods of regional economic development analysis.

**ECDV 664. Population Economics****3 Credits**

Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.

**ECDV 668. Economic Development Finance****3 Credits**

Focuses on the tools and methods of economic development finance.

**ECDV 670. Research in Economic Development****3 Credits**

Intense examination of the academic literature on economic development at all levels.

**Prerequisites:** ECDV 651, ECDV 661 and ECDV 662.

**ECDV 671. Sustainable Economic Development****3 Credits**

Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment.

**Prerequisites:** AEEC 501, AEEC 502 and AEEC 540.

**ECDV 673. Research Methods****3 Credits**

An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized.

**Prerequisites:** AEEC 501, AEEC 502 and AEEC 540.

**ECDV 681. Urban Economic Development****3 Credits**

Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis.

**Prerequisites:** ECDV 651, ECDV 661 and ECDV 662.

**ECDV 682. Rural Development****3 Credits**

Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis.

**Prerequisites:** ECDV 651, ECDV 661 and ECDV 662.

**ECDV 683. Seminar in National Economic Development****3 Credits**

Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects.

**Prerequisites:** ECDV 681 and ECDV 682.

**ECDV 692. Seminar in Economic Development****3 Credits**

Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits.

**Prerequisite:** Completion of at least nine semester hours of ECDV courses.

**ECDV 694. Internship****1-9 Credits (1-9)**

Internship in Economic Development. May be repeated up to 9 credits.

Restricted to: ECDV majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Completion of core requirements of Doctor of Economic Development.

**ECDV 699. Doctoral Project****1-9 Credits (1-9)**

Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

## International Business Courses

**I B 317. International Marketing****3 Credits**

Same as MKTG 317.

**I B 351. International Business****3 Credits**

The various aspects of international business, and identification and analysis of problems encountered by multinational companies.

**Prerequisite:** junior standing or consent of instructor.

**I B 398. International Business and Economic Environments****3 Credits**

Description and analysis of various world regions, e.g., Pacific Rim, Eastern Europe, South Asia. Region will vary from semester to semester.

**I B 449. Open Economy Macroeconomics****3 Credits**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: ECON 449.

**Prerequisite(s):** FIN 341 OR ECON 311.

**I B 450. International Economics****3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: ECON 450G

**Prerequisite(s):** ECON 251G and ECON 252G.

**I B 458. Comparative International Management****3 Credits**

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as Mgt. 458.

**I B 475. International Finance****3 Credits**

Same as FIN 475. Crosslisted with: FIN 475 and FIN 575.

**Prerequisite(s):** FIN 341.

**I B 489. Senior Seminar in International Business****3 Credits**

Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project.

**Prerequisite:** I B core.

**Office Location:** Business Complex Room 234

Phone: (575) 646-7211

Website: <https://business.nmsu.edu/departments/economics/>

## Economics - Bachelor of Arts in Economics

The Bachelor of Arts major in Economics is the only bachelor of arts degree offered through the College of Business. It has the advantage of including a large number of general electives. This feature provides great flexibility to the student who, in addition to completing the courses for a major in economics, may wish to take a double major or take courses from a wide variety of other subjects of his or her own choosing.

This program is suitable for, among others, students who plan to go to graduate school in economics, law, business, the social sciences or other areas.

### Introductory Courses

A candidate for the bachelors of arts in economics must complete the following requirements. In addition, the following courses must be completed with a grade of C- or better:

ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
A ST 311	Statistical Applications (or equivalent)	3
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 191G	Calculus and Analytic Geometry I	

Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.

### Upper Division Economics Courses

The College of Business abides by the university's New Mexico General Education Common Core requirements as outlined in this catalog. To minimize the number of courses taken, students should first review the General Degree requirements listed below. Students who follow the recommendations below will satisfy the university's general education requirements.

ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON 457	Mathematical Economics	3
ECON 489	Senior Economics Seminar	3

### Electives in Economics, Upper-Division

Select 9 credits numbered 300 or above, including at least one course from the following to bring the total upper-division credits in major to 27

ECON 332	Public Finance	3
ECON 336	Labor Economics	3
ECON 449	Open Economy Macroeconomics	3
ECON 450	International Economics	3

<sup>1</sup> Complete with a grade of C- or better.

- <sup>2</sup> MATH 142G Calculus for the Biological and Management Sciences: Students planning to do graduate work in mathematical economics or statistics are urged to take MATH 190G Trigonometry and Precalculus, MATH 191G Calculus and Analytic Geometry I and MATH 192G Calculus and Analytic Geometry II, rather than MATH 142G Calculus for the Biological and Management Sciences.
- <sup>3</sup> 33-40 credits, dependent upon mathematics placement.
- <sup>4</sup> A grade of C- or better required to advance to the next level.
- <sup>5</sup> Students must earn a cumulative GPA of 2.5 in courses counted toward the economics major.
- <sup>6</sup> A description of the requirement and a listing of approved VWW courses can be found in this catalog under Required Courses (p. 46).

## Economics - Bachelor of Business Administration

This program is especially suitable for students who find economics interesting and who intend, perhaps without additional formal education beyond the Bachelor degree, to take jobs in business or government. This degree prepares you for a wide variety of jobs including those leading eventually to positions of executive responsibility. It is also appropriate for those who may choose to seek a Master of Business Administration degree after graduation. It is also a great degree for someone interested in pursuing a career as a lawyer.

In addition to completing general (p. 46) education common core, (p. 46) College of Business foundation and business core (p. 428), Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/essential-information-students/general-education-courses>) requirements, and general electives (see above), every candidate for the bachelor of business administration in economics must complete each of these courses with a grade of C- or better:

ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
A ST 251G	Statistics for Business and the Behavioral Sciences (or equivalent)	3
or A ST 311	Statistical Applications	
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 191G	Calculus and Analytic Geometry I	

### Major Course Requirement

Every candidate must earn a minimum cumulative GPA of 2.5 in the following courses:

#### Major Courses

ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON 489	Senior Economics Seminar	3

#### Electives in Economics, Upper-Division

Select at least 9 credits from 300 or 400 level economics courses including three credit hours from the following:

ECON 332	Public Finance	3
ECON 336	Labor Economics	3

ECON 401	Managerial Economics	
ECON 450	International Economics	
ECON 457	Mathematical Economics	
Total Credits		24

## International Business - Bachelor of Business Administration

The Bachelor of Business Administration in International Business is intended for those who plan to work for government agencies or firms with operations abroad or between the United States and foreign countries. The program prepares you for positions requiring knowledge of international payments, foreign exchange markets, global marketing, export and import procedures, and international investments.

In addition to completing the general education requirements, College of Business foundation courses, business core courses, and Viewing a Wider World requirements, candidates for a bachelor of business administration in International Business must complete the following courses with a grade of C- or better:

ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
A ST 251G	Statistics for Business and the Behavioral Sciences (or equivalent)	3
or A ST 311	Statistical Applications	
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 191G	Calculus and Analytic Geometry I	

### Requirements for Major Courses

Candidates must earn a minimum cumulative GPA of 2.5 in the following major course requirements:

#### International Business Core Courses <sup>1</sup>

I B 351	International Business	3
I B 450	International Economics	3
I B 475	International Finance	3
or I B 449	Open Economy Macroeconomics	
I B 489	Senior Seminar in International Business	3
Select 3 credits from the following:		3
ECON 324V	Developing Nations	
ECON 325V	Economic Development of Latin America	
I B 398	International Business and Economic Environments	
HON 380V	Comparative Economic Systems	

Functional area in business ( 15 credits of upper-division courses in a single functional area of business beyond those elsewhere required for the I B major) <sup>2</sup>

Total Credits 30

<sup>1</sup> At least 12 of the 15 credit hours counted toward the international business core courses must be earned at NMSU (not to include courses completed on study abroad).

<sup>2</sup> At least 9 of the 15 credit hours counted toward the international business functional area must be earned at NMSU (not to include courses completed on study abroad).

## Other Requirements for the Major

**Foreign language:** Students must demonstrate oral and written proficiency at the intermediate mid-level according to ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines. (Process for demonstrating proficiency to be coordinated with the NMSU Department of Languages and Linguistics. Any costs associated with proficiency demonstration will be paid by the student.)

**International experience requirement:** Students must partake of an international experience equivalent to a semester abroad in a university where the language of instruction is not English. The department will determine appropriateness of international experience. Study abroad programs must be pre-approved by IB advisors and Department Head.

## Economics - Undergraduate Minor

The undergraduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro-economic forces influence individuals, business and government decision making. Students thinking of a career in banking and finance, government service, or law will find the minor helpful.

A minor in economics consists of 18 or more credit hours of approved course work in economics (ECON), of which at least 12 are numbered 300 or higher, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

### Required Courses

ECON 251G	Principles of Macroeconomics <sup>1</sup>	3
ECON 252G	Principles of Microeconomics <sup>1</sup>	3
ECON 304	Money and Banking	3
or ECON 311	Intermediate Macroeconomic Theory	
ECON 401	Managerial Economics	3
or ECON 312	Intermediate Microeconomic Theory	
Upper-division courses (300 or higher) in economics		6
Total Credits		18

<sup>1</sup> ECON 201G Introduction to Economics may be substituted for one of Econ 251G Principals of Macroeconomics or Econ 252G Principals of Microeconomics with the approval of the Head of the Department of Economics, Applied Statistics, and International Business.

## International Business - Undergraduate Minor

A minor in international business provides the student with a background in international business that can be useful in many settings given the increasing intensity of globalization. Especially those who wish to find work with large companies with an international presence or for those who may want to own their own business dealing internationally, the minor in international business can help lay the groundwork for a successful career.

A minor consists of 18 or more credit hours of approved course work in the International Business core, all completed with a grade of C- or higher.

At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

#### Required Courses

I B 351	International Business	3
ECON/I B 450	International Economics	3
FIN/I B 475 or ECON 449	International Managerial Finance Open Economy Macroeconomics	3
I B 489	Senior Seminar in International Business	3
Select one from the following:		3
ECON 324V	Developing Nations	
ECON 325V	Economic Development of Latin America	
HON 380V	Comparative Economic Systems	
I B 398	International Business and Economic Environments	
Upper-division business course		3
Total Credits		18

In addition, I B minors must meet the foreign language proficiency requirement described below.

Students must demonstrate oral and written proficiency in a foreign language at the intermediate mid-level according to the ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines. (Process for demonstrating proficiency to be coordinated with the NMSU Department of Languages and Linguistics. Any costs associated with proficiency demonstration will be paid by the student.)

## Applied Statistics - Master of Science

Offered by the Department of Economics, Applied Statistics and International Business, the Master of Science (MS) degree in applied statistics is designed to produce graduates proficient in current practices in statistics and able to enter directly into positions in industry, government or private business. A person completing this degree will have the requisite skills to help researchers outside of statistics execute data analyses, design experiments and/or plan and analyze biological surveys or surveys obtained by mail, phone or personal interview. In addition, a person completing this degree will be familiar with the major statistical packages for computers. Students in the program will receive instruction in both theory and application of statistics, oriented strongly towards linear models and sampling, as well as extensive training and experience in statistical consulting.

The MS degree serves two basic groups of students:

1. students with degrees in areas other than mathematics who wish to strengthen their quantitative skills and
2. students with a degree in mathematics or statistics or those with a strong minor in mathematics who wish to apply statistics in one or more subject matter areas.

## Admission

Requirements for regular admission to the MS in Applied Statistics include the following:

- A minimum 3.0 grade-point average overall or in the last two years of study. Complete graduate and undergraduate transcripts must be supplied.
- Three semesters of engineering calculus, equivalent to MATH 191G Calculus and Analytic Geometry I, MATH 192G Calculus and Analytic Geometry II, and MATH 291G Calculus and Analytic Geometry III at NMSU, completed with B or better grades.
- A one-semester course in introductory statistics. Students entering with only one undergraduate course in statistics will generally take A ST 505 Statistical Inference I. **NOTE: A ST 505 Statistical Inference I does not carry credit toward the MS in applied statistics.**
- Three letters of reference from former professors or others able to evaluate the student's academic potential.
- A one- to two-page typewritten letter of application, discussing academic objectives, and professional plans, plus giving specific reasons for selecting statistics as a field for advanced studies.

In addition to the formal requirements above, some expertise in computer use or programming experience is strongly recommended.

Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). Fluency in written and spoken English is essential to successful completion of the program. Further information regarding the TOEFL can be obtained from:

Test of English as a Foreign Language  
CN 6151  
Princeton, NJ 08541-6151  
USA

## Course Requirements Credit Requirements (Minimum)

### Theory

A ST 565	Statistical Analysis I	4
A ST 566	Statistical Analysis II	4
A ST 567	Applied Linear Models I	3
A ST 568	Applied Linear Models II	3

### Methods

A ST 503	SAS Basics	2
A ST 504	Statistical Software Applications	1
A ST 506	Statistical Inference II	3

### Research (Research Option)

A ST 598	Special Research Problems	4-6
or A ST 599	Master's Thesis	

### Elective Requirements

Select 6-8 credits in research option electives and 12 credits of course-only option electives	20
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### Consulting

A ST 551	Introduction to Statistical Consulting	1
A ST 552	Advanced Statistical Consulting	1
A ST 553	Practicum in Statistical Consulting	1

Total Credits	47-49
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## Economics - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require

more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 501 Microeconomic Theory, AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Those students interested in the concentration in regulatory economics are advised to complete two courses in college-level statistics.

**All students in the program must successfully complete a minimum of 30 credits including the following:**

#### Required Courses

AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
Electives, subject to the restrictions above.		21
Total Credits		30

#### Notes:

1. No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.
2. ECON 503 cannot be counted toward the major in Economics.
3. A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.

Teaching and research assistantships are available to qualified applicants however, admission to the program does not imply or guarantee funding. It is not necessary to have a degree in economics to enter the graduate program or to receive financial assistance. An application and three letters of reference are required to be considered for any available assistantships. These forms can be obtained from the department.

## Concentration: Public Utility Policy and Regulation

#### Requirements

ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3

ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		12

## Concentration: Public Policy

#### Requirements

AEEC 522	Public Sector Economics I	3
AEEC 523	Public Sector Economics II	3
GOVT 530	Seminar in Public Policy	3
Select one from the following:		3
GOVT 537	Issues in Public Policy	
GOVT 540	Seminar in Public Administration	
GOVT 541	Public Budgeting	
GOVT 544	Public Policy Analysis	
Total Credits		12

## Concentration: Econometrics

#### Requirements

AEEC 540	Econometrics I	3
ECON 545	Econometrics II	3
Select 6 graduate credits of A ST (Applied Statistics) at the 500 level <sup>1</sup>		6
Total Credits		12

<sup>1</sup> Excluding A ST 505 Statistical Inference I, independent study, thesis, project and dissertation credits.

**All students in the program must successfully complete a minimum of 30 credits including the following:**

#### Required Courses

AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
Total Credits		9

## Economics - Doctor of Economic Development

The Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

### Requirements

Candidates for the DED enter the program with the equivalent of a master's degree. DED students must successfully complete 60 graduate credits beyond the hours required for entry. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. DED minimum admission requirements include:

1. related master's degree or equivalent coursework;
2. one course in intermediate microeconomic theory and one course in intermediate macroeconomic theory with minimum grades of B;

3. one course in college-level calculus with a minimum grade of B; and
4. one course in statistics, including simple regression with a minimum grade of B.

Additionally, students who have not completed graduate level courses in AEEC 501 Microeconomic Theory, AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I) with grades of B or better will be required to successfully complete these courses early in the DED program.

**All students in the DED program must successfully complete the following:**

ECDV 550	Introduction to Local and Regional Development	3
ECDV 651	Economic Development Theory	3
ECDV 661	Regional Economic Modeling I	3
ECDV 662	Regional Economic Modeling II	3
ECDV 664	Population Economics	3
ECDV 668	Economic Development Finance	3
ECDV 671	Sustainable Economic Development	3
ECDV 692	Seminar in Economic Development (take twice)	3+3
ECDV 681	Urban Economic Development	3
ECDV 682	Rural Development	3
ECDV 683	Seminar in National Economic Development	3
Specialty area (six semester hours)		6
12-15 semester hours of internship and final project		12-15
Select sufficient elective credits to fulfill the 60 hour requirement.		3

Note: Doctor of Economic Development (DED) students who enter the DED with a master's degree may, upon completion of all requirements for the MA in Economics, apply for the MA in Economics degree and count courses that overlap with the DED requirements toward the DED. Students must apply separately for the MA Econ program and master's degree must be conferred before the DED.

Comprehensive and oral exams will be given and will determine eligibility to continue in the program and/or to graduate.

Teaching and research assistantships are available to qualified applicants however admission to the program does not imply or guarantee funding.

Detailed and updated information is available on the departmental website: <https://business.nmsu.edu/academics/graduate-programs/ded/>

## Public Utility Regulation and Economics - Graduate Certificate

The certificate in Public Utility Regulation and Economics (PURE) is a professional educational program designed for post-baccalaureate students pursuing a career in the utility sector, with an electric utility company, natural gas utility, water distribution utility, or with a government agency regulating these types of companies. PURE students must meet the general regulations and minimum requirements for admission to the graduate school and complete 12 credit hours including

ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		12

For details see <https://business.nmsu.edu/academics/graduate-programs/certificate-public-utility/>

## Applied Statistics - Graduate Minor

Master's level students wishing to minor in applied statistics at the master's level must have at least 10 credits of 500-level applied statistics courses. The recommended courses for a general master's-level minor are:

A ST 503	SAS Basics	2
A ST 504	Statistical Software Applications	1
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
Total Credits		10

Depending on a particular student's background, it may be desirable to substitute other A ST courses for the minor. In accordance with Graduate School requirements, doctoral students must have at least 12 credits of 500-level applied statistics courses for a minor at the doctoral level.

Students wishing to obtain the minor in applied statistics should contact an applied statistics faculty member to recommend appropriate applied statistics course work to be included in the plan of study and to serve as the graduate committee representative from the minor area.

## Economics - Graduate Minor

The graduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro- economic forces influence individuals, business and government decision making. Students interested in public utility regulation, banking and finance, government service, or law will find the minor especially interesting.

Graduate students wishing to earn a minor in economics must complete 12 semester credit hours, including:

Select at least two from the following:		6
AEEC 501	Microeconomic Theory	
AEEC 502	Macroeconomic Theory	
AEEC 540	Econometrics I	
ECON or AEEC 500 or higher courses (excluding ECON 503) <sup>1</sup>		6
Total Credits		12

<sup>1</sup> ECON 503 Managerial Economics cannot be counted toward the minor.

Students pursuing the economics minor must fulfill the course prerequisites before enrolling in the graduate courses.

# Finance

## Undergraduate Program Information

Finance is the management of money and cash flow for business organizations, government and individuals. The study of finance involves examining the theory and techniques of managing money, including analysis and management of risk. Finance students learn to apply tools and concepts from mathematics, statistics, economics and accounting to financial decision-making. With this knowledge, finance graduates are in high demand by employers and command some of the highest salaries for college graduates. Depending upon their career goals and interests, finance majors may use the electives in the major to focus their program of study on financial management, financial planning, investments, banking, and/or risk management and insurance.

## Degrees for the Department

Finance - Bachelor of Business Administration (p. 453)

Finance - Graduate Certificate (p. 456)

## Minors

### Can only be earned by non-finance majors

Finance - Undergraduate Minor (p. 455)

Risk Management and Insurance - Undergraduate Minor (p. 455)

Entrepreneurship and Innovation - Undergraduate Minor (p. 455)

### Open to all majors

Business Law - Undergraduate Minor (p. 454)

**(Contact the Finance Department Head in BC 221 prior to signing up for Business Law Minor)**

**Professor, Harikumar Sankaran, Department Head**

**Professors** de Boyrie, Fortin, Martin, Oretskin; Query; Sankaran; **Associate Professors** Clarkson; **Assistant Professors** Holt, Rahman; **College Assistant Professor** Groves; McGonigle

## Finance Courses

### FIN 206. Introduction to Finance

#### 3 Credits

Theory and techniques of financial management for business firms. Includes application of financial analysis tools and techniques needed for business financial administration and decision making. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 106 or higher; BOT 120 or ACCT 221; ECON 201 or ECON 251.

### FIN 210. Financial Planning and Investments

#### 3 Credits

Individual financial planning and related financial markets and institutions. Community Colleges only.

### FIN 303V. Personal Financial Planning and Investing in a Global Economy

#### 3 Credits

Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.

### FIN 311. Financial Futures Markets

#### 3 Credits

Same as AG E 311.

### FIN 322. Principles of Insurance

#### 3 Credits

Theory and practice of insurance and its economics and social significance; review of the major lines of insurance including life, health, and property liability insurance.

### FIN 323. Life/Health/Employee Benefits

#### 3 Credits

Approaches to problems of employee security from the perspective of businesses. Topics including pensions, profit-sharing plans, 401(k) plans, group life and health plans, and flexible benefit programs. The course also addresses individual life, health, and annuity contracts within a financial planning context.

**Prerequisite:** FIN 322.

### FIN 324. Property and Liability Insurance

#### 3 Credits

Analysis of property and liability insurance with emphasis on handling of commercial exposures. Review of property and liability company operations including rate making and insurance accounting. **Prerequisite:** FIN 322

### FIN 325. Real Estate Principles and Law I

#### 3 Credits

Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BLAW 325.

### FIN 326. Business Risk Management

#### 3 Credits

The operational risks faced by firms and the study of various methods of handling these risks, including loss prevention, risk retention, self-insurance, corporate insurance programs, and capital markets.

**Prerequisites:** FIN 322

### FIN 327. Analysis of the Excess and Surplus Lines Insurance

#### 3 Credits

Analysis of excess and surplus lines segment of the insurance industry, including ratemaking, pricing of insurance, regulation, marketing of insurance, reinsurance, and product development. Students groups will research and design a new insurance product as part of the class.

### FIN 341. Financial Analysis and Markets

#### 3 Credits

Financial analysis for business financing and investing decisions. **Prerequisites** ACCT 221, ECON 251, ECON 252, MATH 121G or 230, A ST 251 or A ST 311 or STAT 251G.

### FIN 355. Investments

#### 3 Credits

Analysis of investment risks and rewards and of the problems of portfolio selection and management. Operation of the securities market.

**Prerequisite(s):** FIN 341 with a grade of C- or better.

**FIN 360. Financial Information Technology****3 Credits**

Integrated use of electronic financial information resources with spreadsheet and word processing applications in investigating financial issues and solving financial problems. FIN 341 with a grade of C- or better.

**Prerequisite(s):** FIN 341 or consent of instructor.

**FIN 385. Analysis of Financial Markets and Institutions****3 Credits**

Analysis of the financial system, emphasizing its institutions and instruments.

**Prerequisite(s):** FIN 341 with a grade of C- or better.

**FIN 391. Finance Internship and Cooperative Education I****1-3 Credits**

Introduction and application of finance principles in a work environment. Open only to students in the finance major or minor who will be working with an approved employer in a finance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required.

**FIN 392. Insurance Internship and Cooperative Education I****1-3 Credits (1-3)**

Introduction and application of insurance principles in a work environment. Open only to students in the finance major or insurance minor who will be working with an approved employer in an insurance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required. Restricted to Finance majors.

**FIN 393. Banking Internship and Cooperative Education****1-3 Credits (1-3)**

Professional banking experience with opportunities to engage in business analysis and to observe application of business principles in the management of a banking entity or a regulatory agency with banking oversight. Open only to students in the finance major or banking minor who will be working with an approved employer in a banking related position, over a period of 12 weeks or at least 300 work hours. May be repeated up to 3 credits. Consent of Instructor required.

**FIN 406. Theory of Financial Decisions****3 Credits**

Contemporary financial theory. Firm valuation, investments and financing decisions, risk analysis.

**Prerequisite(s):** FIN 341 with a grade of C- or better.

**FIN 421. Personal Financial Planning for Professionals****3 Credits**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.

**Prerequisite(s):** FIN 341, or consent of Instructor.

**FIN 435. Investment Analysis****3 Credits**

Efficiency of capital markets, modern portfolio management, special topics of current interest to investment analysts.

**Prerequisite:** FIN 355.

**FIN 436. Applied Security Analysis and Portfolio Management****1-3 Credits (1-3)**

Application of analytical tools to security selection and portfolio management Pre/

**Corequisite(s):** FIN 435.

**FIN 445. Fixed Income Markets, Instruments and Derivatives****3 Credits**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored.

**Prerequisite(s):** FIN 341.

**FIN 455. Derivative Markets and Securities****3 Credits**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles.

**Prerequisite(s):** FIN 355.

**FIN 466. Financial Policy Decisions****3 Credits**

Application and integration of financial theory, concepts, and practice using the case method.

**Prerequisite:** FIN 406 or consent of instructor.

**FIN 470. Real Estate Appraisal****3 Credits (2+2P)**

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to student in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with: AG E 470.

**Prerequisite(s):** Junior or above standing.

**FIN 475. International Managerial Finance****3 Credits**

International aspects of financial transactions, decision-making, banking and financial markets. Same as I B 475.

**Prerequisite:** FIN 341.

**FIN 480. Management of Financial Institutions****3 Credits**

Asset and liability management of financial institutions; emphasis on commercial bank management.

**Prerequisite:** FIN 385 or consent of instructor.

**FIN 490. Selected Topics****1-3 Credits**

Current topics in finance.

**Prerequisites:** vary according to the seminar being offered.

**FIN 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisites:** junior or above standing and consent of instructor.

**FIN 500. Concepts in Finance****1 Credit**

An overview of fundamental principles of finance necessary for prospective MBA students who do not have an undergraduate background in finance. Includes: Time value of money concepts and calculations; risk and calculation of return given appropriate risk measures; bond risk characteristics and calculation of the value of a bond; calculation of the value of common stock (determination as to whether a stock is over-valued or under-valued); and calculation of the costs of capital and capital budgeting problems using the cost of capital.  
**Prerequisite(s):** admitted to MBA Program or consent of course department.

**FIN 503. Financial Management****3 Credits**

Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions.  
**Prerequisite(s):** FIN 341 with a grade of B or better.

**FIN 511. Financial Futures Markets****3 Credits**

Same as AEEC 511.

**FIN 521. Personal Financial Planning for Professionals****3 Credits**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.

**Prerequisite(s):** FIN 503 or FIN 341 or consent of instructor.

**FIN 535. Investment Concepts****3 Credits**

Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management.

**Prerequisite(s):** FIN 355 or FIN 503.

**FIN 536. Applied Security Analysis and Portfolio Management****1-3 Credits (1-3)**

Application of analytical tools to security selection and portfolio management. Pre/

**Corequisite(s):** FIN 435 or FIN 535.

**FIN 545. Fixed Income Markets, Instruments and Derivatives****3 Credits**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Assignments and exams will be differentiated from the undergraduate cross-listed course. In addition, graduate students are expected to complete a project. Crosslisted with: FIN 445.

**FIN 555. Derivative Markets and Securities****3 Credits**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Same as FIN 455 with differentiated assignments for graduated students.

**Prerequisite(s):** FIN 503 or instructor permission.

**FIN 566. Advanced Financial Management****3 Credits**

Application and integration of financial theory, concepts, and practice using the case method.

**Prerequisite:** FIN 503.

**FIN 575. International Managerial Finance****3 Credits**

International aspects of financial transactions, decision-making, banking and financial markets.

**Prerequisite(s):** FIN 503 or FIN 341.

**FIN 581. Management of Financial Institutions****3 Credits**

Asset and liability management of financial institutions; emphasis on commercial bank management.

**Prerequisite(s):** FIN 385 or FIN 503.

**FIN 590. Selected Topics****1-3 Credits (1-3)**

Current topics in finance. Taught with FIN 490 with differentiated assignments for graduate students. Consent of instructor required.

**FIN 598. Special Research Programs****1-3 Credits**

Directed individual reading or research.

**Prerequisite:** consent of instructor.

**Name:** Hari Sankaran

**Office Location:** Business Complex, Room 215

**Phone:** (575) 646-3201

**Website:** <http://business.nmsu.edu/academics/finance/>

## Finance - Bachelor of Business Administration

Finance is the crossroads of economics, strategy and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in a variety of areas including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, and derivatives.

Courses in the BBA in Finance are organized into four options: Financial Analyst, Banking and Financial Planning, Risk Management and Insurance, and Entrepreneurial Finance. Students may pursue one or more options. If a student chooses not to pursue a option, they may select four courses from any option. The option(s) will not appear on the transcript.

## Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

### Required Courses

12

FIN 355	Investments
FIN 360	Financial Information Technology
FIN 385	Analysis of Financial Markets and Institutions

FIN 406	Theory of Financial Decisions	
<b>Twelve credits from:</b>		<b>12</b>
A declared option below		
or		
Four courses from any option, for students not wishing to declare an option		
<i>Financial Analyst Option (12 credits from the following)</i>		
FIN 311	Financial Futures Markets	
FIN 435	Investment Analysis	
FIN 445	Fixed Income Markets, Instruments and Derivatives	
FIN 455	Derivative Markets and Securities	
FIN 466	Financial Policy Decisions	
FIN 470	Real Estate Appraisal	
FIN 475	International Managerial Finance	
FIN 391	Finance Internship and Cooperative Education I	
FIN 498	Independent Study	
<i>Banking and Financial Planning Option (12 credits from the following)</i>		
FIN 480	Management of Financial Institutions (Required)	
FIN 393	Banking Internship and Cooperative Education	
FIN 421	Personal Financial Planning for Professionals	
FIN 435	Investment Analysis	
FIN 445	Fixed Income Markets, Instruments and Derivatives	
FIN 470	Real Estate Appraisal	
FIN 498	Independent Study	
<i>Risk Management and Insurance Option (12 credits from the following)</i>		
FIN 322	Principles of Insurance (Required)	
FIN 323	Life/Health/Employee Benefits	
FIN 324	Property and Liability Insurance	
FIN 326	Business Risk Management	
FIN 327	Analysis of the Excess and Surplus Lines Insurance	
FIN 421	Personal Financial Planning for Professionals	
FIN 392	Insurance Internship and Cooperative Education I	
FIN 498	Independent Study	
<i>Entrepreneurial Finance Option (12 credits from the following)</i>		
ENTR 331	Business Creation and Valuation	
ENTR 332	Entrepreneurial Finance	
ENTR 333	Business Analysis and Turnaround	
BLAW 330	Entrepreneurial Law	
FIN 466	Financial Policy Decisions	
FIN 391	Finance Internship and Cooperative Education I	

FIN 498	Independent Study	
<b>Total Credits</b>		<b>24</b>

Every candidate for this major must fulfill the general education common core (p. 46), College of Business foundation and business core (p. 428), Viewing (p. 46) a Wider World (p. 46) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration.

## Suggested Plan of Study

Course	Title	Credits
<b>Junior</b>		
<b>Fall</b>		
FIN 341	Financial Analysis and Markets	3
FIN elective		3
		<b>Credits</b>
		<b>6</b>
<b>Spring</b>		
FIN 355	Investments	3
FIN 360	Financial Information Technology	3
FIN 385	Analysis of Financial Markets and Institutions	3
		<b>Credits</b>
		<b>9</b>
<b>Senior</b>		
<b>Fall</b>		
FIN 406	Theory of Financial Decisions	3
FIN elective		3
		<b>Credits</b>
		<b>6</b>
<b>Spring</b>		
FIN elective		3
FIN elective		3
		<b>Credits</b>
		<b>6</b>
		<b>Total Credits</b>
		<b>27</b>

## Business Law - Undergraduate Minor

In a world that is increasingly subject to laws and regulations, every business needs employees who are savvy about the laws that affect business. The Business Law minor is comprised of a series of courses designed to provide a strong background in a wide range of laws that business need to be aware of, and provide students with the ability to recognize – and avoid – legal pitfalls. Additionally, the Business Law minor will provide students with a clear understanding of how legal disputes are resolved and the ability to appreciate the cost and complexity of disputes, and enable students to reduce the costs and complexities by being able to communicate clearly with lawyers about the legal issues.

## Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies. Students interested in pursuing this

minor should contact the Finance Department Head in BC 221 ([https://maps.nmsu.edu/building\\_info/327](https://maps.nmsu.edu/building_info/327)).

#### Required Courses

BLAW 316	Legal Environment of Business	3
BLAW 313	Sports and the Law	3
BLAW 385V	Consumers and the Law	3
BLAW 330	Entrepreneurial Law	3

#### Take any 2 courses from the following:

BLAW 325	Real Estate Principles and Law I	6
BLAW 430V	American Indian Law and Policy	
BLAW 418	Uniforms Commercial Code and Advanced Business Law Topics	
HRTM 304	Hospitality and Travel Law	
AG E 314	Agricultural and Natural Resource Law	
HON 335V	Legal Issues in Modern Society	
GOVT 391	Constitutional Law	

Total Credits 18

## Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor

The Entrepreneurship and Innovation minor is designed to promote entrepreneurship to students across the NMSU campus. This minor will appeal to creative and ambitious students who envision launching and managing their own business or entering careers in innovation-driven fields. The flexible design allows students to complete a designated, approved cluster of related courses that provide a discipline-specific entrepreneurial flavor. Such clusters are under development.

### Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed at NMSU. This minor is not open to students in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

#### Required Core Courses

ENTR 331	Business Creation and Valuation	3
ENTR 332	Entrepreneurial Finance	3
BLAW 330	Entrepreneurial Law	3

#### Business Cluster Courses: Choose any 3 from the following

B A 490	Selected Topics	9
ENTR 333	Business Analysis and Turnaround	
MKTG 312	Personal Selling	
MKTG 324	Product/Service Development	

Total Credits 18

## Finance - Undergraduate Minor

The minor in Finance, available to students in most majors (business and non-business), affords students the opportunity to select their minor courses to provide a focus on any one of several sub-specialties within the field of Finance. Faculty advisors in the department can assist students in selecting their Finance electives to provide a focus in financial

management, financial planning, or investments. (This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.)

### Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses and a minimum cumulative GPA of 2.0 in the FIN courses. At least twelve credits for the minor must be completed at NMSU.

#### Required Courses

ACCT 221	Principles of Accounting I (Financial)	3
FIN 341	Financial Analysis and Markets	3
Select any three additional, upper division, finance courses <sup>1</sup>		9
Select any additional upper division business course		3
Select one from the following:		3
ECON 201G	Introduction to Economics	3
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
Total Credit Hours		21

<sup>1</sup> Upper division Finance courses must have a number greater than 310.

## Risk Management and Insurance - Undergraduate Minor

The minor in Insurance, available to students in most majors (business and non-business), affords students the opportunity to supplement their major field of study with specialized expertise in the field of risk management and insurance.

### Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed at NMSU. The minor is not available to students in the Bachelor of Individualized Studies or the Bachelor of Applied Studies.

#### Required Courses

FIN 322	Principles of Insurance	3
FIN 341	Financial Analysis and Markets	3
or FIN 303V	Personal Financial Planning and Investing in a Global Economy	
BLAW 316	Legal Environment of Business	3
or BLAW 385V	Consumers and the Law	

Any three upper division finance courses chosen from the following.

FIN 323	Life/Health/Employee Benefits	
FIN 324	Property and Liability Insurance	
FIN 326	Business Risk Management	
FIN 327	Analysis of the Excess and Surplus Lines Insurance	
FIN 392	Insurance Internship and Cooperative Education I	
FIN 498	Independent Study	

FIN 421	Personal Financial Planning for Professionals <sup>1</sup>	
Total Credits		18

<sup>1</sup> Fin 421 cannot be taken if Fin 303V is applied toward the minor.

## Finance - Graduate Certificate

### Admission requirements:

1. Completion of a Bachelors or other advanced degree with a minimum GPA of 3.0.

2. Earned a B or better in the following NMSU courses – or their equivalents – within seven years prior to acceptance into the program:

FIN 341	Financial Analysis and Markets	3
MATH 142G	Calculus for the Biological and Management Sciences	3
STAT 251G	Statistics for Business and the Behavioral Sciences	3

or A ST 251G Statistics for Business and the Behavioral Sciences

or

Undergraduate GPA of at least 3.25 with 2 or more years of experience<sup>1</sup>

<sup>1</sup> Two or more years of relevant, full-time, post-degree, professional work experience in the finance industry. See <http://gradfincert.nmsu.edu> for more details.

3. Please visit [gradschool@nmsu.edu](mailto:gradschool@nmsu.edu) and submit an application online. The application fee is \$30 for U.S. residents and \$40 for International Students. International students have to submit their TOEFL scores. All applicants will be notified via email of their acceptance into the program.

### Certificate Course Requirements

Students admitted into the program may apply for the Graduate Certificate in Finance after the completion of any of the four courses from the list below. Courses are offered in a traditional classroom and/or online.

Choose four from the following: 12

FIN 503	Financial Management
FIN 511	Financial Futures Markets
FIN 521	Personal Financial Planning for Professionals
FIN 535	Investment Concepts
FIN 545	Fixed Income Markets, Instruments and Derivatives
FIN 555	Derivative Markets and Securities
FIN 566	Advanced Financial Management
FIN 575	International Managerial Finance
FIN 581	Management of Financial Institutions

Total Credits 12

## Management

### Undergraduate Program Information

The major in general business is based on a broad range of course options rather than a narrow focus on a single discipline. Graduates find careers in large and small businesses, in government agencies and in the nonprofit sector. The general business major is well suited to the part-time and working student because it allows the student to select courses that will better meet their individual schedule. The entrepreneurship concentration is ideal for a student interested in starting or acquiring a small business or entering a family business upon graduation. The curriculum provides a focus on small and new enterprises, thus reflecting the entrepreneurial nature of contemporary business in the U.S.

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and business core, Viewing a Wider World requirements and general electives. Students will choose one of the three concentrations that follow.

### Degrees for the Department

General Business - Bachelor of Business Administration (p. 459)

Management - Bachelor of Business Administration (p. 459)

### Minors for the Department

Management - Undergraduate Minor (p. 460)

Sustainability - Undergraduate Minor (p. 460)

Kathy Brook, Interim Department Head

**Professors** Benson, Bishop, Boje, Hoffman, Jun, Rosile; **Associate Professors** Adler, Smith; **Assistant Professors** Flinchbaugh

### Management Courses

**MGT 201. Introduction to Management**

**3 Credits**

Covers the functioning and administration of different types of complex organizations. Concepts and theories of management and organizational behavior.

**MGT 309. Human Behavior in Organizations**

**3 Credits**

Interpersonal and organizational behavior, motivation, communication, team building, leadership, diversity management, legal and ethical issues, and politics in organizations. Credit may not be earned for both MGT 309 and MGT 315V.

**MGT 310V. Entrepreneurial Mindset**

**3 Credits**

This course provides the opportunity to learn to think like an entrepreneur in the broader context of social entrepreneurship, intrapreneurship, creative problem solving, opportunity recognition, and innovation.

**MGT 315V. Human Relations in Organizations****3 Credits**

Interactions among people and groups in societies where organizations abound. Focus on the behavior of people in organizational situations and approaches for understanding that behavior. Explores motivation, communication, leadership and team processes. Restricted to nonbusiness majors. Credit may not be earned for both MGT 309 and MGT 315V.

**MGT 332. Human Resources Management****3 Credits**

Survey course in human resources management. Includes recruitment, selection, equal employment opportunity, performance appraisal, training, compensation, safety, and union-management relations.

**MGT 333. Training and Development****3 Credits**

Training and development of human resources, including training needs assessment, training approaches and techniques, and evaluation of training effectiveness.

**MGT 335V. Business and Government****3 Credits**

Crosslisted with: ECON 335G

**MGT 344. Production and Operations Management****3 Credits**

Management of physical and human resources; management information systems in operations; applications in various organizations.

**Prerequisite:** STAT 251G or A ST 251G or A ST 311; and BCIS 338 or BCIS 350.

**MGT 345V. Quality and Competitiveness: An International Perspective****3 Credits**

Quality management and competitiveness are studied in manufacturing, services, and the public sector with an international perspective. Topics include: global history of quality, foreign competition and its impact on quality and productivity, quality management and continuous improvement, international operations management, quality assessment, and a review of the emergence of quality and competitiveness in government, education and health care.

**MGT 347. Management Functions and Processes****3 Credits**

Planning, organizing, directing, and controlling operating units in an organization. Applications to a variety of types of organizations.

**MGT 351. Supply Chain Management****3 Credits**

Acquisition and control and delivery of materials, parts, equipment, and services for end use in the organization. Applications to service and manufacturing industries, nonprofit, and governmental institutions.

**MGT 360V. Negotiation and Business Conflict Resolution: Theory and Practice****3 Credits**

Covers the basics of negotiation theory and practice including the use of quantitative methods and their realistic application in resolving disputes. Application of conflict resolution skills.

**MGT 361. Small Business Management****3 Credits**

Principles and practice of managing a small enterprise with emphasis on growth and performance.

**MGT 375V. Global Environmental Assessment and Management****3 Credits**

Examines the principles of environmental assessment and management. Topics include global environmental concerns, industrial environmental management, life cycle assessment, system analysis, process improvement, and sustainable development, among others.

**MGT 388V. Leadership and Society****3 Credits**

Exploration of the multifaceted nature of leadership in modern society through readings and seminar discussion.

**MGT 391. Management Internship and Cooperative Education I****1-3 Credits**

Application of management skills to the work environment. Open only to students majoring or minoring in management. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

**Prerequisites:** MGT 309 and consent of instructor.

**MGT 448. Small Business Consulting****3 Credits**

Study analysis and presentation of recommendations for solving significant problems confronting small businesses.

**Prerequisite(s):** Senior standing or consent of instructor.

**MGT 449. Strategic Management****3 Credits**

Integrative approach to envisioning the future and shaping strategies for business success.

**Prerequisite(s):** BCIS 338 or 350; BLAW 316; FIN 341; MGT 309; MKTG 303; and one of the following: MGT 344 or MGT 470 or BCIS 485.

**MGT 451. Selection, Placement, and Performance Evaluation****3 Credits**

Staffing processes for organizations and the evaluation of employee performance. Use of selection methods and measurement of work behavior.

**MGT 453. Leadership and Motivation****3 Credits**

Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Crosslisted with: I E 453

**MGT 454. Work Teams in Organizations****3 Credits**

Theories of small groups and their application to the work situation. Why and how groups form, grow, communicate, and maintain themselves.

**Prerequisites:** senior or above standing.

**MGT 458. Comparative International Management****3 Credits**

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as I B 458.

**MGT 460. Compensation Management****3 Credits**

An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration.

**Prerequisite(s):** MGT 332 or consent of instructor.

**MGT 461. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MKTG 461.

**Prerequisite(s):** Senior standing or consent of instructor.

**MGT 465. Contemporary Issues in Human Resources Management****3 Credits**

Integrative course in human resources management, emphasizing the application of advanced concepts to complex personnel cases.

**Prerequisite:** MGT 332.

**MGT 466. Managing Electronic Commerce: A Business Models****Perspective****3 Credits**

Surveys the emerging Internet technology involving business to business, business to consumer, and consumer to consumer forms of trade. Covers quantitative decision and negotiation analysis techniques as well as auction and market trade mechanisms.

**MGT 470. Project Management in Organizations****3 Credits**

Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.

**MGT 490. Selected Topics****1-18 Credits (1-18)**

Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.

**MGT 491. Management Internship and Cooperative Education II****1-3 Credits**

Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

**Prerequisite:** MGT 309 and consent of instructor.

**MGT 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisites:** junior or above standing and consent of instructor.

**MGT 502. Operations Management****3 Credits**

Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources.

**Prerequisite(s):** Graduate students only.

**MGT 503. Organizational Behavior and Management Processes****3 Credits**

Covers the theory and practice related to the successful management of human resources in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory.

**Prerequisite:** graduate students only.

**MGT 512. Quantitative Analysis for Business Decisions****3 Credits**

Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making.

**Prerequisite:** graduate students only.

**MGT 527. Negotiation and Business Dispute Resolution****3 Credits**

Same as BLAW 527.

**MGT 548. Small Business Consulting****3 Credits**

Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGT 448 with differentiated assignments for graduate students.

**Prerequisite(s):** Graduate standing.

**MGT 590. Strategic Management****3 Credits**

Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Restricted to majors.

**Prerequisite:** M.B.A. student in his or her final semester.

**MGT 591. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.

**Prerequisite(s):** Graduate standing.

**MGT 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 6 credits may be earned.

**Prerequisite:** consent of instructor.

**MGT 600. Doctoral Research****1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to management majors.

**MGT 601. Research in Management****1 Credit**

Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.

**MGT 640. Instructional Development for Teaching Business****3 Credits**

Pedagogical issues and techniques in collegiate business education. Includes course and curriculum development, outcomes assessment, class management, and teaching techniques. Practical issues faced in college instruction. Restricted to doctoral students.

**MGT 645. Seminar in Human Resources Management****3 Credits**

Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students.

**MGT 650. Seminar in Organizational Behavior****3 Credits**

Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students.

**MGT 655. Seminar in Organizational Systems and Theory****3 Credits**

Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students.

**MGT 660. Research Design and Methodology****3 Credits**

Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students.

**MGT 661. Qualitative Research Methods****3 Credits**

In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action research, and ethnomethodology. Restricted to doctoral students.

**MGT 670. Seminar in Operations Management****3 Credits**

Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology.

**Prerequisite(s):** Restricted to Doctoral students.

**MGT 675. Seminar in Strategic Management****3 Credits**

Survey of current and classical readings in strategy. Introduces the doctoral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students.

**MGT 685. Story Consulting to Organizations****3 Credits**

Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact) intervention with a local consenting organization. Restricted to doctoral students.

**MGT 690. Special Topics****3 Credits**

Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students.

**Prerequisite(s):** Vary according to seminar being offered.

**MGT 698. Special Topics****1-3 Credits**

**Prerequisite:** consent of instructor.

**MGT 700. Doctoral Dissertation****15 Credits**

**Prerequisite:** advancement to candidacy.

**Name:** Kathy Brook, Interim Department Head

**Office Location:** Business Complex, Room 220

**Phone:** (575) 646-1201

**Website:** <http://business.nmsu.edu/departments/mgt/>

## General Business - Bachelor of Business Administration

### General Business Major

**Major Courses**

Major requirements (upper division)	24
Total Credits	24

**No more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

**Note:** The general business option is offered through a 2+2 Online Distance Education Degree Completion Program as well. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs/>

### Concentration: Entrepreneurship

**Major Courses**

MGT 332	Human Resources Management	3
MGT 361	Small Business Management	3
MGT 461	Seminar in Entrepreneurship	3
MGT 448	Small Business Consulting	3
Major requirements (upper division)		12
Total Credits		24

**Of the remaining 12 credits for the entrepreneurship concentration, no more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

## Management - Bachelor of Business Administration

The Department of Management invites you to consider a major in management. Do you like to work with people? Need help solving

people problems at work? Hope to start your own business? Want to run an environmental project, or a bank, a store, a farm or a government agency? Are you interested in how people from diverse backgrounds work together to achieve common goals? If you answered yes to any of these questions, you should consider a major in management. The mission of the department is to prepare graduates, with a Bachelor of Business Administration, for management careers in a broad spectrum of New Mexico, national and globally oriented businesses. Management graduates work in small and large agricultural, manufacturing, government, transportation, public utility, merchandising, health care, environmental and communications organizations among others.

The study of management offers the opportunity to develop skills in utilizing human, physical and economic resources to achieve organizational objectives. These are important cross-functional skills in today's competitive job market. Students will acquire the skills and knowledge to develop their potential and to lead others in a common mission. Management majors may choose from program concentrations in human resource management, project and supply chain management or small business management and entrepreneurship.

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives (see above). Students will choose one or more of the four options that follow.

## Concentration: Human Resource Management

### Major Courses

MGT 332	Human Resources Management	3
MGT 451	Selection, Placement, and Performance Evaluation	3
MGT 460	Compensation Management	3
MGT 458 or MGT 465	Comparative International Management Contemporary Issues in Human Resources Management	3
Electives in management, upper division		12
Total Credits		24

## Concentration: Project and Supply Chain Management

### Major Courses

MGT 332	Human Resources Management	3
MGT 351	Supply Chain Management	3
MGT 470	Project Management in Organizations	3
BCIS 485	Enterprise Resource Planning	3
MKTG 324	Product/Service Development	3
BCIS 461	Business Analytics I	3
Electives in MGT or ENTR, upper division		6
Total Credits		24

## Concentration: Small Business Management and Entrepreneurship

### Major Courses

MGT 332	Human Resources Management	3
MGT 361	Small Business Management	3
MGT 461	Seminar in Entrepreneurship	3
MGT 448	Small Business Consulting	3
Electives in management, upper division		12
Total Credits		24

## Management - Undergraduate Minor

The management minor requires 18 upper division credits in management. Business majors must take any six upper-division management courses (3 credits each). The management minor for non-business majors consists of:

MGT 309 or MGT 315V	Human Behavior in Organizations Human Relations in Organizations	3
Select five other upper division Management courses <sup>1</sup>		15
Total Credits		18

<sup>1</sup> One 3-credit upper division course in the College of Business may substitute for one of the required five management courses.

At least 12 credits for the minor must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

To obtain a Management minor, a grade of C- or better must be attained in the courses required.

## Sustainability - Undergraduate Minor

Students must complete 18 credits for the minor, nine credits of which must be upper division courses, and at least 12 credits of which must be completed at NMSU. A 2.0 GPA or better is required in the courses completed in fulfillment of the minor. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

### Requirements

Select 18 credits, 9 of which are upper division from the following:

E S 110G	Introductory Environmental Science
PHLS 305V	Global Environmental Health Issues
HON 305V	Global Environment
HORT 100G	Introductory Plant Science
HORT 315	Crop Physiology
HRTM 430	Hospitality Facilities Management
HRTM 450	Special Topics
HRTM 492	Special Problems
MGT 375V	Global Environmental Assessment and Management
MGT 388V	Leadership and Society
MGT 448	Small Business Consulting
MGT 449	Strategic Management
MGT 458	Comparative International Management
MGT 465	Contemporary Issues in Human Resources Management
MGT 490	Selected Topics

MPH 550

Environmental Public Health Issues

Total Credits

18

## Marketing

### Undergraduate Program Information

Marketing majors learn skills and knowledge relevant to the co-creation of goods, services and ideas that uniquely meet the needs and wants of global customer markets and society at large. Career opportunities exist in marketing management, advertising, market research, promotion management, sales and sales management, social media, distribution management, and retailing. The major is designed to allow a great deal of choice so students may emphasize any combinations of these areas.

Most marketing majors enter into careers in business firms, although some find job opportunities in governmental and other nonprofit organizations. Still others become involved in owning and managing their own companies. Opportunities in entrepreneurship and small business are expanding at a rapid pace.

### Graduate Program Information

The College offers a program leading to a Ph.D. degree (Doctor of Philosophy in Business Administration) (p. 439). The faculty of the Ph.D. Program in Business Administration is committed to training researchers and educators who will shape business scholarship, practice, and pedagogy. The program emphasizes preparing candidates to understand the complexities of modern business while they develop a specialized area of expertise in marketing or management. The Ph.D. in Business Administration provides graduates with the opportunity to pursue a variety of career paths within academia and within industry. Currently a concentration is offered in marketing.

### Degrees for the Department

Marketing - Bachelor of Business Administration (p. 463)

### Minors for the Department

Advertising - Undergraduate Minor (p. 464)

Marketing - Undergraduate Minor (p. 464)

Professional Selling - Undergraduate Minor (p. 464)

Sports Marketing - Undergraduate Minor (p. 464)

**Professor, Nancy A. Oretskin, Interim Department Head**

**Professors** Hyman, Jasso, Plouffe **Associate Professor** Niculescu; **College Professor** Gavin; **College Assistant Professors** Blaugrund, Holguin; **Emeritus Professors** Peterson, Sautter

### Marketing Courses

**MKTG 180. PGA Golf Management Freshman Orientation**

**3 Credits**

Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America Students will also be introduced to the Qualifying Level of the PGA's Educational Program, Rules of Golf, PGA Constitution and the History of the PAG. Additional course fee required. Consent of Instructor required. Restricted to: PGA Golf Management Students. MKTG/PGM majors.

**MKTG 181. Level 1, PGA's PGM Education Program (Part 1)**

**3 Credits**

Introduction of Level 1 of the PGA's Educational Program. This class will focus on Business Planning and Operations, Customer Relations, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 203. Introduction to Marketing**

**3 Credits**

Covers processes, functions and principles in the current marketing system. Includes role of marketing in the economy, types of markets, product development, distribution channels, pricing and promotion strategies, market research and management of the processes. Community Colleges only.

**MKTG 280. Level 1, PGA's PGM Education Program (Part 2)**

**3 Credits**

Continuation of Level 1 of the PGA's PGM Education Program. This class will focus on Tournament Operations, Golf Car Fleet Management and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 281. Level 1, PGA's PGM Education Program (Part 3)**

**1.5 Credits**

Completion of Level 1 of the PGA's PGM Education Program. This class will focus on Introduction to Teaching and Golf Club Performance and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 303. Principles of Marketing**

**3 Credits**

Process, functions, and principles in the current marketing system.

**MKTG 305. Marketing Food and Agricultural Products**

**3 Credits**

Same as AG E 305. Crosslisted with: AG E 305.

**MKTG 310. Marketing Research**

**3 Credits**

Design, collection analysis, and presentation of research data.

**Prerequisites:** A ST/STAT 251G or consent of instructor.

**MKTG 311V. Consumer Behavior**

**3 Credits**

The different aspects of consumer behavior and the variables affecting consumer decisions. Analysis of current concepts and models.

**MKTG 312. Personal Selling**

**3 Credits**

Implementation of the promotion process through interpersonal communications between salesperson and prospects. Serving customers by sales representatives.

**MKTG 313. Retail Management**

**3 Credits**

Investigates retail business operations and focuses on the strategic profit model, store location, layout, display, merchandising, operations, and personnel.

**MKTG 314. Advertising Strategy**

**3 Credits**

Utilization of advertising as a business administration function; communication with consumers as a means of attaining marketing goals.

**MKTG 317. International Marketing****3 Credits**

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as IB 317.

**MKTG 324. Product/Service Development****3 Credits**

Covers product innovation, development, commercialization and resource recovery, price determination and administration strategies, and complementing planning processes.

**MKTG 354. Sports Marketing****3 Credits**

The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.

**MKTG 357. Internet and Social Media Marketing****3 Credits**

Focuses on the consumer psychology and marketing strategies at work in advertising and selling brands via the Internet and social media networks.

**MKTG 380. Level 2, PGA's PGM Education Program (Part 1)****1.5 Credits**

Introduction to Level 2 of the PGA's PGM Education Program. This class will focus on Merchandising and Inventory Management, Golf Operations and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 381. Level 2, PGA's PGM Education Program (Part 2)****1.5 Credits**

Completion of Level 2 of the PGA's PGM Education Program. This class will focus on Turfgrass Management, Intermediate Teaching and Golf Club Alteration and corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 400. Marketing Internship/Field Experience****3 Credits**

Internship of field experience in application of marketing principles. The student must accept an internship before being allowed to enroll in the course. Consent of instructor required. Restricted to MKTG majors.

**MKTG 414. Athletics Business Administration****3 Credits**

This course examines the marketing and operations of sports programs with emphasis on Division I Collegiate Programs. Topics include event management, ticketing, marketing, trademark and licensing, NCAA compliance, development, finance, contracts, facility maintenance, television, and the roles and responsibilities of the coaches.

**MKTG 449. Promotion Management****3 Credits**

Covers concepts and problems in the use of advertising, internet marketing, social media marketing, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.

**MKTG 451. Food and Agribusiness Market Assessment and Research****3 Credits**

Same as AG E 451. Consent of Instructor required. Crosslisted with: AG E 451.

**MKTG 453. Sales Management****3 Credits**

The nature of the sales management function in industry. Focuses on intra and interdepartmental sales management activities.

**Prerequisite(s):** MKTG 312.

**MKTG 461. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MGT 461.

**Prerequisite(s):** Senior standing or consent of instructor.

**MKTG 462. Advanced Sales****3 Credits**

Advanced instruction and skill development in interpersonal communication skills to broaden understanding of the professional sales role (especially in team selling situation), career management, personal productivity, negotiation, and coordination with other functional areas.

May be repeated up to 3 credits.

**Prerequisite(s):** MKTG 312.

**MKTG 480. Level 3, PGA's PGM Education Program (Part 1)****1.5 Credits**

Introduction to Level 3 of the PGA's PGM Education Program. This class will focus on Human Resource Management/Supervising and Delegating, Food and Beverage and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 481. Level 2, PGA's PGM Education Program (Part 2)/ Final Experience****3 Credits**

Completion of Level 3 of the PGA's PGM Education Program. This Class will focus on Advanced Teaching and Club fitting, Player Development/ Teaching Business. The Final Experience and the corresponding PGA Work Experience Activities. Please note that the following are requirements for successful completion of this senior level PGA Golf Management capstone course: 16 months of internship, completion of the Qualifying Level, Level 1, Level 2, and Level 3 of the PGA's PGM Education Program and successful completion of the PGA's Playing Ability Test. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 489. Strategy and Policy****3 Credits**

Techniques and analysis of marketing strategy and policy planning and formulation.

**Prerequisites:** senior standing or consent of instructor.

**MKTG 490. Selected Topics****1-18 Credits (1-18)**

Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.

**MKTG 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisites:** junior or above standing and consent of instructor.

**MKTG 500. Concepts in Marketing****1 Credit**

An overview of fundamental principles of Marketing necessary for prospective MBA students who do not have an undergraduate background in Marketing. Includes: Terminology, basic functions and responsibilities associated with practice of marketing.

**Prerequisite(s):** Admitted to MBA program or consent of course department.

**MKTG 503. Marketing Management****3 Credits**

Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions. Graduate students only.

**Prerequisite(s):** MKTG 303 or equivalent with a grade of B or better.

**MKTG 591. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGT 591.

**Prerequisite(s):** Graduate standing.

**MKTG 601. Marketing Management****3 Credits**

Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.

**MKTG 610. Marketing and the Scientific Method****3 Credits**

Issues related to the evolution of research philosophies and methodologies. Critical to the development of appreciation for the value of research and experimentation.

**MKTG 620. Research- Theory Interface****3 Credits**

Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required.

**MKTG 625. Consumer Behavior****3 Credits**

Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary issues relevant to the study of marketing.

**MKTG 640. Measurement and Structural Equation Modeling****3 Credits**

Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. May be repeated up to 3 credits.

**Prerequisite(s):** A ST 505.

**MKTG 670. Marketing Theory****3 Credits**

The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing.

**MKTG 690. Special Topics in Marketing****3 Credits**

A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.

**MKTG 698. Selected Topics****1-9 Credits (1-9)**

Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.

**MKTG 700. Doctoral Dissertation****15 Credits**

**Prerequisite:** advancement to candidacy.

**Name:** Interm Dept. Head Nancy A. Oretskin

**Office Location:** BC Suite 212

**Phone:** (575) 646-3341

**Website:** <https://business.nmsu.edu/departments/marketing/>

## PGA Golf Management Program

**Name:** *Director* Gavin; *Program Specialist* Salmon; *Program Coordinator* Stetina

**Office Location:** BC Suite 212

**Phone:** (575) 646-2814

**Website:** <https://business.nmsu.edu/academics/undergraduate/golf/>

## Marketing - Bachelor of Business Administration

### Marketing Major

**Major Courses**

MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
Electives in Marketing, upper division		18
Total Credits		24

*Note: The marketing major is offered through a Online Distance Education Degree Completion Program as well. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs/>*

### Concentration: PGA Golf Management

**Major Courses**

MKTG 180	PGA Golf Management Freshman Orientation	3
MKTG 181	Level 1, PGA's PGM Education Program (Part 1)	3
MKTG 280	Level 1, PGA's PGM Education Program (Part 2)	3
MKTG 281	Level 1, PGA's PGM Education Program (Part 3)	1.5
MKTG 310	Marketing Research	3
MKTG 313	Retail Management	3

MKTG 380	Level 2, PGA's PGM Education Program (Part 1)	1.5
MKTG 381	Level 2, PGA's PGM Education Program (Part 2)	1.5
MKTG 480	Level 3, PGA's PGM Education Program (Part 1)	1.5
MKTG 481	Level 2, PGA's PGM Education Program (Part 2)/ Final Experience	3
Elective in Marketing, upper division		9
<b>Other Requirements</b>		
HORT 377	Introduction to Turfgrass Management	4
HRTM 420	Club Management and Marketing	3
HRTM 450	Special Topics	1-4
Total Credits		41-44

*Note: Students must apply separately to the PGA Golf Management Program for acceptance. Acceptance is limited to the fall of every year.*

## Advertising - Undergraduate Minor

As soon as you consider a minor in Marketing, visit the Department of Marketing, Business Complex, room 209 to arrange a consultation with a Marketing Faculty member for guidance and a suggested plan of study for the minor. All courses taken for the minor must be upper-division (300 level or above) with a cumulative grade point average of 2.0 for all of the 18 credits. At least 12 credits of the total 18 credits for this minor must be completed at NMSU.

*This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.*

### Requirements

MKTG 303	Principles of Marketing	3
MKTG 311V	Consumer Behavior	3
MKTG 314	Advertising Strategy	3
MKTG 449	Promotion Management	3
Additional credits from any College of Business prefix (including MKTG)		6
Total Credits		18

## Marketing - Undergraduate Minor

### Requirements

MKTG courses <sup>2</sup>	12
Additional credits from any College of Business prefix (including MKTG)	6
Total Credits	18

<sup>2</sup> HRTM 301 Hotel, Restaurant, and Tourism Marketing may be substituted.

1. As soon as you consider a minor in Marketing, visit the Department of Marketing, Business Complex, room 209 to arrange a consultation with a Marketing Faculty member for guidance and a suggested plan of study for the minor.
2. All courses must be upper-division (300 level or above).
3. A cumulative grade point average of 2.0 for the 18 credits must be earned.

4. At least 12 credits for the minor must be completed at NMSU.
5. This minor is not open to majors in the Bachelor of Interdisciplinary Studies and the Bachelor of Applied Studies.

## Professional Selling - Undergraduate Minor

If you are considering the Minor in Professional Selling, please visit the Department of Marketing, Business Complex, room 209 to arrange a consultation with a Marketing Faculty member for guidance and a suggested Plan of Study for the minor, etc. Students must have a cumulative grade point average of 2.0 in the 18 credits in order to earn the Minor in Professional Selling. Also, at least twelve credits for the minor must be completed at NMSU.

This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

### Required Courses

MKTG 303	Principles of Marketing	3
MKTG 312	Personal Selling	3
MKTG 462	Advanced Sales	3
MGT 360V	Negotiation and Business Conflict Resolution: Theory and Practice	3
MKTG 400	Marketing Internship/Field Experience	3
MKTG 453	Sales Management	3
Total Credits		18

## Sports Marketing - Undergraduate Minor

### Requirements

MKTG 303	Principles of Marketing	3
MKTG 313	Retail Management	3
MKTG 354	Sports Marketing	3
Additional MKTG courses		3
Additional credits from any College of Business prefix (including MKTG)		6
Total Credits		18

1. As soon as you consider a minor in Marketing, visit the Department of Marketing, Business Complex, room 209 to arrange a consultation with a Marketing Faculty member for guidance and a suggested plan of study for the minor.
2. All courses must be upper-division (300 level or above).
3. A cumulative grade point average of 2.0 for the 18 credits must be earned.
4. At least 12 credits for the minor must be completed at NMSU.
5. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

# COLLEGE OF EDUCATION

Dean - *Don Pope-Davis*

Associate Dean for Academic Affairs- *Enedina García Vázquez*

Interim Associate Dean for Research - *Susan Brown*

Assistant Dean for Budget and Finance - *Juanita Hannan*

Assistant Dean - *Gladys De Necochea*

## General Undergraduate Requirements

1. Entering freshman with an ACT score of 17 or lower will be invited to take a study skills class to ensure a successful college experience.
2. Complete at least 120 - 132 acceptable credits, including a minimum of 48 credits in courses numbered 300 or above with a cumulative GPA of 2.5 or above.
3. Satisfy the general education requirements. Detailed programs are available in the College of Education Undergraduate Resource Center and the Center for Academic Advising and Support Services (CAASS).
4. Students must complete all professional education courses and all courses in their teaching field or major with a grade of C- or better.
5. All students, including transfer students, must complete the last 30 semester credits required for the baccalaureate degree on the New Mexico State University campus. The four-year Servicemen's Opportunity College Program students are not exempt from this regulation.
6. All majors require a minimum 2.5 cumulative GPA to graduate, except Kinesiology, which requires a 2.75 cumulative GPA and Communication Disorders, which requires a 3.2 cumulative GPA.
7. Students in teacher preparation programs must be officially admitted to the Teacher Education Program. See requirements under Admission to the Teacher Education program and Competitive Admission Process.
8. In addition, if faculty at any time determine that a student is below expected program requirements in a particular skill, the College of Education may require remedial procedures.

### General Education Requirements (except teacher education programs)

1. Nine to ten credits in General Education Area I (language arts)
2. Three credits in General Education Area II (mathematics)
3. Eight credits in General Education Area III (laboratory science)

For Areas IV and V, a total of 15 credits

1. Six-nine credits from General Education Area IV (social/behavioral sciences)
2. Six-nine credits in General Education Area V (humanities and fine arts)

## Transferring Undergraduate Courses

Certain College of Education courses have been identified as transferable from NMSU to other public two-year and four-year institutions in New Mexico. The equivalent course at other institutions can be identified using the common course number. Similarly, students from other institutions can use the common course number to identify education courses that can be transferred to NMSU.

## Competitive Undergraduate Admission Process for Teacher Education Program

Applicants who successfully complete the minimum requirements for admission will be reviewed by the Teacher Education Program (TEP) admission committee. The admission committee will base acceptance decisions on the applicant's academic qualifications, written communication, faculty recommendations, dispositions and the student's portfolio.

Even though students declare their majors when they enter New Mexico State University, teacher candidates are not officially admitted to the Teacher Education Program until they formally apply and meet the following requirements:

1. A cumulative grade-point average of at least 2.5.
2. Must complete 55 credit hours.
3. Complete appropriate program prerequisites. See College of Education Undergraduate Resource Center for specific program prerequisites.
4. Demonstration of competence in reading, mathematics, and composition by passing the Pearson NES Essential Academic Skills tests.
5. Submit a portfolio for admission to the Teacher Education Program. Faculty will review portfolios. Admission to TEP is contingent on faculty approval. See the Office of Teacher Candidate Preparation for further clarification.

Applicants should be aware that admission to the Teacher Education Program is competitive and is based upon available faculty resources. Posted GPA and basic skills test scores are minimums which are necessary to be considered for admission by the Teacher Education Program committee and do not ensure admittance into programs. Applicants are encouraged to develop a strong student portfolio, achieve the highest GPA possible, and present the portfolio in a professional manner.

Transfer students will have their transcripts evaluated by the Registrar's Office and must meet all basic skills requirements, as well as be admitted to the Teacher Education Program through the formal application procedures.

Students who are not admitted may not take designated professional education courses numbered above 299. Students with a bachelor's degree seeking teacher licensure must meet all admission criteria for the Teacher Education Program and be admitted to the Graduate School.

Students must be officially approved for student teaching during his/her senior year. Prior to student teaching, complete teaching field requirements, and pass the Pearson NES Assessments test.

Each student must possess the academic ability, character, and disposition suitable for teaching. A student who, in the professional judgment of the faculty and staff, does not possess these qualifications may be examined by a Selective Review Committee. The committee may recommend any of a variety of actions, ranging from remedial procedures to withdrawal from the College.

Students with a bachelor's degree seeking teacher licensure must meet all admission criteria for the Teacher Education Program and be admitted to the Graduate School.

## Suggested Program of Study

Requirements for each teaching field/endorsement are available in the College of Education Undergraduate Resource Center and the Center for Academic Advising and Support Services (CAASS). It is imperative that students, especially those new to the campus, report frequently to CAASS to have their programs carefully and continually monitored in line with newly developing requirements.

All students are prepared to pursue a baccalaureate program leading to a Level I Teaching License. All students must work with an academic advisor to ensure a complete program of study for their specific degree.

## Undergraduate Students with Degrees Seeking Certification Only

All students who already have a bachelor's degree and who are seeking licensure must be admitted through a graduate licensing program. Details are available in the College of Education Undergraduate Resource Center.

## Time Limit on Undergraduate Teacher Education Courses

Any education course more than seven years old taken at NMSU or at another institution will not be counted toward the student's undergraduate program. A student may meet with the appropriate department to have the courses time limit reviewed. The department head and/or faculty may recommend accepting a course that is seven years old with approval from the Dean's office. Any course not approved must be repeated by the student.

## Withdrawing Undergraduate Teacher Education Students

The College of Education reserves the right to withdraw students who are registered in 300-level or above teacher education courses who are not admitted to the Teacher Education Program.

## Undergraduate Admission to Student Teaching

To be admitted to student teaching a student must:

1. Students must be officially approved for student teaching during his/her senior year.
2. Submit complete formal application to the College of Education Undergraduate Resource Center by March 9 for spring and by October 9 for fall a year prior to student teaching.
3. Maintain a cumulative grade-point average of at least 2.5 prior to beginning student teaching.
4. Complete the teaching field requirements and pass the Subject Area Assessment tests of the Pearson NES or New Mexico Teacher Assessment Content test.
5. Complete all requirements to student teaching (details available from the College of Education Undergraduate Resource Center).
6. Students must complete all professional education courses and all courses in the student's teaching field with a grade of C- or better.
7. Admission to Student Teaching is contingent upon faculty approval.

Students who do not meet all College of Education requirements for admission to student teaching will not be allowed to begin their student teaching until those requirements are met.

Student teachers can only be placed within an 80-mile radius of the campus within the state of New Mexico.

## Undergraduate Student Teaching Expectations

During the senior year, students must keep their last semester free from other responsibilities so that they can fully devote their time to their student teaching responsibilities. Students are expected to follow the public school calendar rather than the university calendar. Student teachers should expect to meet all requirements of the school and school district in which they are working.

## Undergraduate Licensure Requirements

In the event that state teacher licensure requirements change, students preparing for licensure to teach should keep abreast of the licensure requirements of the New Mexico Public Education Department. Copies of the rules and regulations governing licensure are available for students in the Office of Teacher Candidate Preparation. College of Education requirements meet or exceed the state licensure requirements. Whenever state licensure requirements are less than College of Education requirements, students must meet the College of Education requirements to receive a degree from or be recommended for licensure by NMSU. The College of Education reserves the right to change its requirements at any time in order to comply with changes in the regulations governing licensure.

Applying for teacher licensure is the responsibility of the student. The New Mexico Public Education Department grants licensure.

The State of New Mexico requires that all candidates for licensure take and pass the state license examination: NMTA Competency or the Pearson NES Profession Knowledge exam. In addition, for elementary education majors the NES: Essential Components of Elementary Reading Instruction is a requirement for licensure. The tests are administered throughout the year and information is available through NES website (<http://nestest.com>).

## Graduate Work

The College of Education offers curricula leading to the degrees of

- Master of Arts,
- Master of Arts in Teaching (p. 480),
- Specialist in Education (p. 480),
- Doctor of Education and
- Doctor of Philosophy in Education.

Those interested in pursuing graduate degrees in education should consult the Graduate Catalog for full information. A copy may be procured by writing the dean of the Graduate School or visiting <http://gradschool.nmsu.edu>.

## Bachelor Degrees

**Bachelor of Applied Studies**

**Majors in:**

- Zero to Four Non-Licensure Track (Early Childhood) (p. 497)

#### **Bachelor of Arts in Dance** (p. 525)

#### **Bachelor of Science in Athletic Training** (p. 522)

#### **Bachelor of Science in Counseling and Community Psychology**

#### **Bachelor of Science in Education**

##### **Majors in:**

- Communication Disorders (p. 544)
- Early Childhood Education (p. 490)
- Elementary Education (p. 491)
- Special Education (p. 546)
- Secondary Education (p. 493) (with concentrations (also know as teaching fields) in):
  - Science
  - Language Arts
  - Math Education
  - Social Studies

#### **Bachelor of Science in Kinesiology**

- Kinesiology (p. 527) (with Concentrations in:
  - Clinical Exercise Science
  - Exercise Science
  - K-12 Physical Education
  - Performance Psychology

## **Masters Degrees**

#### **Master of Arts**

- Clinical Mental Health Counseling (p. 478)
- Communication Disorders (p. 552)
- Education (p. 499)
  - Bilingual Education
  - Curriculum and Instruction
  - Early Childhood Education
  - Early Childhood Special Education
  - Educational Learning Technologies
  - Language, Literature and Culture
  - Teaching English to Speakers of Other Languages
- Educational Administration (p. 507)
- Special Education (p. 552)

#### **Master of Arts in Teaching**

- Dance
- Math Science and
- Spanish

#### **Specialist in Education:**

- School Psychology (p. 479)

## **Graduate Certificates**

Autism Spectrum Disorders (<http://catalogs.nmsu.edu/nmsu/education/special-education-communication-disorders/autism-spectrum-disorders-grad-cert>)

## **Doctoral Degrees**

#### **Doctor of Education**

- Curriculum and Instruction (p. 500)
- Educational Administration (p. 508)
- Special Education (p. 553)

#### **Doctor of Philosophy**

- Counseling Psychology (p. 479)
- Curriculum and Instruction (p. 501)
- Educational Administration (p. 508)
- Kinesiology (p. 533)
- Special Education (p. 554)

## **Undergraduate Minors**

- Counseling and Educational Psychology (p. 478)
- Dance (p. 532)
- Early Childhood Education (p. 498)
- Educational Leadership and Administration (p. 507)
- Exercise Science (p. 533)

## **Graduate Minors**

- Educational Administration (p. 503)
  - Focus in: Higher Education Administration
  - Focus in: Pk-12 School Administration
- Integrated Behavioral Health Care (p. 479)
- Spanish Counseling (p. 479)
- Special Education (p. 555)

## **Accreditation**

The College of Education provides undergraduate students with a broad general education and professional teacher preparation. The university's teacher preparation program, which involves several colleges and which is directed by the College of Education, was accredited in 1962 by the National Council for Accreditation of Teacher Education (NCATE). Also in the College of Education the Communication Disorders master's program in Speech-Language Pathology is accredited by the American Speech-Language-Hearing Association (CAA - ASHA), and the undergraduate Athletic Training Degree in Kinesiology and Dance is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). The undergraduate and graduate programs that prepare individuals for licensure to work in public and private schools in New Mexico have been approved by the New Mexico State Public Education Department.

Other programs with national recognition include the Master of Arts (MA) in Clinical Mental Health Counseling, accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP); the Specialist in Education (Ed. S.) in school psychology, accredited by the National Association of School Psychologists (NASP) and the doctoral (Ph. D.) program in counseling psychology accredited

by the American Psychological Association (APA). The post-doctoral program in Clinical Psychopharmacology holds APA designation.

## Counseling and Educational Psychology

### Undergraduate Program Information

The BS in Counseling and Community Psychology (CCP) prepares students to work at the bachelors level with a focus on case management, interpersonal skills, understanding human behavior, multicultural awareness, awareness of mental health issues and licensure as a substance abuse counselor. The Counseling and Community Psychology undergraduate major prepares students for graduate school in order to become practitioners in the field of psychology with an additional focus on research and graduate psychology practice opportunities.

### Graduate Program Information

The major thrust of the Counseling and Educational Psychology (CEP) Department is the preparation of personnel for work in counseling, educational diagnostics, school psychology, counseling psychology and related areas. Four graduate degrees are available:

1. Masters of Arts
2. Specialist in Education
3. Doctor of Philosophy
4. Postdoctoral Masters of Science

#### Departmental Admission Requirements

Admission requirements and procedures are specific to each degree program in the Department of Counseling and Educational Psychology. Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to CEP graduate programs. To be considered for admission to CEP Graduate Programs, application requirements include, but are not limited to the following:

1. Graduate Record Examination (GRE) scores from within the last 5 years
2. Completion and submission of NMSU on-line graduate application form and fee
3. Receipt of official undergraduate and graduate transcripts of all colleges and universities previously attended by the NMSU Admissions Office
4. Letters of recommendation from three persons familiar with the applicant's academic and/or professional record
5. Curriculum vitae or resume which includes a list of completed upper-division and/or graduate coursework related to counseling, school psychology, counseling psychology or related professions.
6. Letter of intent and/or statement of purpose
7. Interviews are required as a part of the selection process

For more information about the CEP Department, program admission procedures and requirements of degree programs, contact the department office or visit the departmental website.

#### CEP Departmental Policy on Enrollment Restrictions for Graduate Courses

##### Restricted Enrollment:

Due to student demand, limited university resources and the nature of graduate training programs which lead to licensure in the helping

professions, enrollment in CEP graduate level courses is restricted to those graduate students who have been admitted to both the Graduate School, as well as to the particular academic program. These programs include:

- Masters in Clinical Mental Health Counseling
- Masters in Educational Diagnostics
- Specialist in Education in School Psychology
- Doctorate in Counseling Psychology
- Postdoctoral Masters in Clinical Psychopharmacology

This restriction also applies to persons who may wish to audit a course.

It is anticipated that certain situations may warrant an exception from the general rule limiting enrollment. The process to obtain an exception is provided in the following section.

#### Exception Criteria and Process:

Exceptions to this policy may be granted by the department head, provided a screening process similar and equally rigorous to that required for admission to the program is performed. An exception must be requested prior to enrollment and shall include:

1. Consideration and validation of the reason provided by the individual requesting to enroll, which must include academic and professional qualifications relevant to the professional level of study. For example, active licensure as a psychologist is required to audit or register for courses in the postdoctoral program in Psychopharmacology.
2. Agreement from the individual that they will comply with all program requirements imposed for those who are admitted to the program, such as a background check.
3. Examples of justifications that will be considered sufficient to warrant an exception and permit students to register for graduate courses in CEP include:
  - a. Previous admission by NMSU for purposes of a graduate minor in the helping professions. For example, the Minor in Integrated Behavioral Healthcare, which is also open to graduate students previously admitted to Social Work, Public Health, Nursing, and Marriage and Family Therapy programs.
  - b. Licensed graduates of the Postdoctoral MS of Clinical Psychopharmacology program who need continuing education credits to maintain competency.
4. Written, including electronic, approval from the:
  - a. Course Instructor,
  - b. Program Director, and
  - c. CEP Department Head.

## Degrees for the Department

Counseling and Community Psychology - Bachelor of Science (p. 476)

Clinical Mental Health Counseling - Master of Arts (p. 478)

School Psychology - Specialist in Education (p. 479)

Counseling Psychology - Doctor of Philosophy (p. 479)

Clinical Psychopharmacology - Post Doctoral Master of Science (p. 478)

## Minors for the Department

Counseling and Educational Psychology - Undergraduate Minor (p. 478)

Spanish Counseling - Graduate Minor (p. 479)

Integrated Behavioral Health Care - Graduate Minor (p. 479)

**Professor, Barbara Gormley, Department Head**

**Regents Professor:** E. Adams, L. Vázquez; **Professors:** D. Pope-Davis, B. Gormley, C. McDougall, E. Vázquez; **Associate Professors:** E. Arroyos; **Assistant Professors:** N. Choi, I. Torres-Fernandez; T. Hitter, M. Kalkbrenner, A. Lopez, A. Pérez-Rojas,

*B. Gormley, Ph.D. (Michigan State University)- race & gender, power dynamics, psychotherapy, mentoring, adult attachments; E. Adams, Ph.D. (Ohio State University)-multiculturalism & diversity, mindfulness, supervision; E. Arroyos, Ph.D. (University of Iowa)- school psychology, traumatic brain injury, mentoring, multicultural competence; N. Choi, Ph.D. (University of Maryland)- racial and cultural factors affecting mental health, Asian and Asian American health and mental health, multicultural issues in supervision and training; D. Pope-Davis, Ph.D. (Stanford University)-multicultural counseling, education and psychology; I. Torres-Fernandez, Ph.D. (University of Iowa)- school psychology, prevention, classroom guidance; T. Hitter, Ph.D. (New Mexico State University)-counseling psychology, identity and self-concept, sexuality and sexual satisfaction; M. Kalkbrenner, Ph.D. (Old Dominion University)- college student mental health, reducing barriers to help seeking behaviors among mental health professionals, and experiential learning; A. Lopez, Ph.D. (University of Texas-San Antonio)-multicultural counseling, social justice, immigration, bilingual counseling/supervision, eating disorders and body image; C. L. McDougall, Ph.D. (University of North Dakota)-clinical psychopharmacology, cross-cultural psychology; A. Pérez-Rojas, Ph.D. (University of Maryland)- psychotherapy process and outcome with emphasis on the therapeutic relationship, college student mental health, bilingualism, acculturation, Latino/a mental health, and role of culture in psychotherapy; E. Vázquez, Ph.D. (University of Iowa)- school psychology, assessment, psychoeducational interventions, acculturation, ethnic and linguistic diversity; L. Vázquez, Ph.D. (University of Iowa)- counseling psychology, multicultural curriculum development and counseling, bilingual therapy, acculturation, identity development, and phenotype research.*

## Counseling and Educational Psychology Courses

**C EP 110G. Human Growth and Behavior**

**3 Credits**

Introduction to the principles of human growth and development throughout the life span.

**C EP 199. Academic Excellence**

**1 Credit**

Academic curriculum of excellence that includes the development of collaborative learning and student success environment, learning diverse learning styles and multiple intelligences, and developing multi-contextual academic communication styles. Students must enroll in course for both Fall and Spring semesters. Course does not count toward CEP minor. May be repeated up to 2 credits.

**C EP 210. Educational Psychology**

**3 Credits**

Psychological foundations as they apply to the learner in the class room setting.

**C EP 215. The Preschool Child**

**3 Credits**

Survey of psychological development from conception to age five.

**C EP 240. Adolescence in School Settings**

**3 Credits**

Survey of psychological development during the adolescent years.

**C EP 298. Exploration of Counseling & Community Psychology**

**3 Credits**

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Course does not count towards CEP minor. May be repeated up to 6 credits.

**C EP 298 H. Exploration of CCP**

**3 Credits**

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Taught with 298 with differentiated instruction and/or independent project to be determined. Restricted to Las Cruces campus only.

**C EP 299. Academic Excellence Classes**

**1-6 Credits (1-6)**

Academic curriculum of excellence that includes an in-depth understanding of the elements that promote student academic success. Students will develop leadership and presentation skills needed to forge effective student mentor relationships and conduct outreach to campus and local community leaders to cultivate a collaborative learning environment. May be repeated up to 6 credits.

**C EP 300V. Human Relations Training**

**3 Credits**

Gain skills, knowledge, and sensitivity for living and working with others.

**C EP 320. Sex Roles in Education**

**3 Credits**

Physiological, psychological, and political aspects of sex role socialization and the effects of these factors on personal development.

**C EP 420. Introduction of Mindfulness Practice**

**3 Credits**

Students will learn about contemplative practices through learning and participation in various mindfulness practices. Engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning.

**C EP 451V. Introduction to Counseling**

**3 Credits**

Principles of counseling for nonmajors.

**C EP 455. Addictions Prevention and Recovery**

**3 Credits**

Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. Taught with C EP 555.

**C EP 461. Family Guidance**

**3 Credits**

Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems. Taught with C EP 561.

**Prerequisite(s):** C EP 110G.

**C EP 495. Psychology, Multiculturalism and Counseling**

**3 Credits**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.

**C EP 495 H. Psych., Multiculturalism & Counseling****3 Credits**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psycho-social development, academic achievement and counseling. Taught with CEP 495. Differentiated instruction/independent project to be determined.

**C EP 498. Internship in Counseling & Community Psychology****1-6 Credits (1-6)**

Students will explore in more depth the fields of counseling, community, and school psychology professions by completing an internship. Through the completion of the internship students will gain hands on work experience, enhance sensitivity for respect with working with diverse populations, and hone their interpersonal skills needed to succeed in the counseling, community, and school psychology professions. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CCP majors.

**C EP 499. Independent Study****1-6 Credits**

Individual study directed by consenting faculty.

**C EP 503. Introduction to Counseling****3 Credits**

Overview of counseling theory, techniques, ethics, and professional issues. Same as C EP 451V. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, CEP, SPSY majors.

**C EP 505. Appraisal of Psychoeducational Achievement in a Diverse Society****3 Credits**

Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, SPSY, CEP majors.

**C EP 511. Introduction to Inferential Statistics****3 Credits**

An introduction to the theories and techniques of inferential statistics as applied to education and psychology. Includes sampling distributions, confidence intervals, t-test, correlation, and chi-square. Intended primarily for post-baccalaureate students. Both hand calculation and computer packages will be employed. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, SPSY, CEP, NURS, FCS majors.

**C EP 512. Human Development****3 Credits**

Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC, C G, CEP, SPSY majors.

**C EP 515. Learning Theory****3 Credits**

Survey and comparison of theory and research regarding human learning as they apply to development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Crosslisted with: C EP 615. Restricted to: C G, CMHC, CEP, SPSY majors.

**Prerequisite(s):** C EP 512 or consent of instructor.

**C EP 517. Multicultural Counseling****3 Credits**

Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C EP 512 or concurrent enrollment or consent of instructor. Restricted to: C G, CMHC, CEP, SPSY majors.

**C EP 519. Psychology of Social Identities****3 Credits**

Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Same as C EP 619. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, CEP, SPSY majors.

**Prerequisite(s):** C EP 512 or concurrent enrollment or consent of instructor.

**C EP 520. The Art & Science of Mindfulness****1-3 Credits (1-3)**

In this course students will learn about contemplative practices by learning about and participating in various mindfulness practices for self-care and to increase well-being. Students will learn about psychological theories and research that support the use of mindfulness in helping others increase their well-being. Students will learn how to teach mindfulness to others. Taught with CEP 490. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CEP, CMHC, SPSY, MSW, MPH, FCS majors.

**C EP 522. Organization and Administration of School Counseling Services****3 Credits**

Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CEP, CMHC, SPSY majors.

**C EP 524. Professional Issues in Mental Health Counseling**  
**3 Credits**

History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: C G,CEPCMHC,SPSY majors.

**C EP 529. Indigenous Counseling Theory and Practice**  
**3 Credits**

Students will explore current uses of indigenous modes and methods of counseling and therapy that are theoretically consonant with Indigenous/ Native traditions. They will examine the integration of such modes to ensure a progressive reconstruction of the counseling endeavor to include an indigenous epistemology in their work with clients. Taught with CEP 429. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: C G,CMHC,CEP,SPSY majors.

**C EP 532. Research Methods**  
**3 Credits**

Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,CEPCMHC,SPSY majors.

**C EP 542. Appraisal Theory and Technique**  
**3 Credits**

Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC,CEPC G, SPSY, majors.  
**Prerequisite(s):** C EP 512 and C EP 517, or consent of instructor.

**C EP 547. Appraisal of Cognitive Functioning**  
**3 Credits**

Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Taught with CEP 647. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP,SPSY,CMHC,C G majors.  
**Prerequisite(s):** C EP 542 or consent of instructor.

**C EP 549. Indigenous Research Methods**  
**3 Credits**

Students will gain an understanding of ethical and respectful research practices from an Indigenous/culturally appropriate vantage. They will thoroughly examine the works of Native/Tribal and Indigenous scholarship. Additionally, safeguards for ethical research practices with native populations will be thoroughly examined with regard to intent, practice, and integration of outcome. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,CMHC,CEP,SPSY majors.

**C EP 550. Counseling Theory and Technique**  
**3 Credits**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 512, or concurrent enrollment.

**C EP 551. Diagnosis and Treatment Planning**  
**3 Credits**

Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 512 or concurrent enrollment or consent of instructor.

**C EP 552. Career/Life Planning and Vocational Assessment**  
**3 Credits**

Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: C G,CMHC,CEP,SPSY majors.

**Prerequisite(s):** Consent of instructor.

**C EP 554. Counseling Theory and Techniques for School Psychologists**  
**3 Credits**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CMHC,C G,CEP majors.

**C EP 556. Addictions Counseling**  
**3 Credits**

Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 550.

**C EP 558. Child and Adolescent Counseling Theory and Technique  
3 Credits**

Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 550 or consent of instructor.

**C EP 559. Healing Trauma, Including Historical and Intergenerational  
3 Credits**

Students will learn about Trauma to gain a deeper understanding of the socio-political implications of colonization on Native people groups. They will learn about incidents of physical and mental health disparities. Students will thoroughly examine the impact of the current mental health field on Native/Indigenous populations and engage the literature from Native Scholars to problem solve and create new ways to address the challenges that Native people and their communities face as members of mainstream Western society. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,CMHC,CEP,SPSY majors.

**C EP 562. Family Therapy Theory and Technique  
3 Credits**

Major theories of family therapy and associated assessment, intervention and evaluation techniques. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 550.

**C EP 563. Primary Care Psychology  
3 Credits**

Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,SPSY,CMHC,MSW,CEP,MPH majors.

**C EP 566. Group Work Theory and Technique  
3 Credits**

Didactic and experiential learning in group theory and practice. Laboratory involves experiences in group participation and leadership. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 550, C EP 562 or consent of instructor.

**C EP 569. Indigenous Counseling Internship  
1-6 Credits (1-6)**

The primary purpose for this course is to provide students with the opportunity to study and practice under a well-known and recognized indigenous healing practitioner with the primary goal of affirming and activating the holistic paradigm of Indigenous knowledge into their work as practitioners in the helping professions to reveal the wealth and richness of Indigenous languages, worldviews, teachings and experiences. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: C G,CMHC,SPSY,CEP majors.

**C EP 572. Counseling Practicum  
1-6 Credits**

Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Crosslisted with: C EP 662. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 550 or consent of instructor.

**C EP 578. Advanced Counseling Practicum  
3-6 Credits**

Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of counseling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 572, C EP 566, or consent of instructor.

**C EP 579. Clinical Psychopharmacology  
3 Credits**

Basic biological aspects of psychopharmacology with applications to clinical populations and treatment implications. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** Consent of instructor.

**C EP 580. Counseling Internship  
3-12 Credits**

Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Restricted to: C G,CEP,CMHC,SPSY majors.

**Prerequisite(s):** C EP 578.

**C EP 598. Special Research Programs****1-6 Credits**

Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 9 credits. Restricted to: C G,SPSY,CMHC,CEP majors.

**C EP 599. Master's Thesis****15 Credits**

Thesis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits. Restricted to: SPSY,CMHC,C G,CEP majors. Thesis/Dissertation Grading.

**C EP 607. Curriculum-Based Assessment and Intervention****3 Credits**

The study and practice of curriculum-based assessment and intervention for academic skills and problems among children and adolescents. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP majors.

**C EP 608. Diagnostic Class****3 Credits**

Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP,SPSY majors.

**C EP 612. Human Development****3 Credits**

Same as C EP 512 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP majors.

**C EP 615. Cognitive and Affective Bases Behavior****3 Credits**

This course provides an overview of cognitive and affective bases of behavior as well as the integration of cognition and affect in psychological processes. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Crosslisted with: C EP 515. Restricted to: C G,CMHC,SPSY, CEP majors.

**Prerequisite(s):** C EP 512.

**C EP 616. Spanish for Mental Health Professionals****3 Credits**

This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: SPSY,CEP majors.

**Prerequisite(s):** Enrolled in Bilingual School Psychology Training Grant with instructor consent.

**C EP 617. Psychology of Multiculturalism****3 Credits**

In this advanced course for post-master's graduate students in applied fields of psychology, students will apply psychological concepts related to multiculturalism as well as critical race theories, feminist theories, queer theories, and liberation theories to understand intersecting social identities. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

**C EP 618. Psychology of Poverty****3 Credits**

This course is designed to examine the nature, extent and impact of poverty on Southwestern populations and across the United States in relation to assessment and interventions and its impact on the education and psychological well-being of children and families. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

**C EP 619. Psychology of Social Identities****3 Credits**

Same as C EP 519 with differentiated assignments for Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP majors.

**C EP 622. Ethical/Professional Issues in Counseling Psychology****3 Credits**

History of counseling psychology, scientist-practitioner model, American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Focus on current ethical, professional, and scientific issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CEP majors.

**Prerequisite(s):** Consent of instructor.

**C EP 624. Ethics, Law & Professional Issues in School Psychology****3 Credits**

This course provides an introduction and overview of the profession of school psychology with emphasis on the roles, functions, and competencies of the school psychologist within the context of legal and ethical practice. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY majors.

**C EP 625. Legal and Ethical Issues in School Psychology****3 Credits**

Overview of legal/ethical, and professional standards in school psychology. NASP and APA codes of ethics, NM Mental Health and Children's codes, and child abuse/neglect laws. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 624.

**C EP 630. School Psychology Research and Program Evaluation****3 Credits**

Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**C EP 632. Counseling Psychology Research****3 Credits**

Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP major or consent of instructor.

**C EP 634. Introduction to Qualitative Research****3 Credits**

This course is intended to be an introduction to qualitative research methods for persons wishing to understand, apply, and conduct qualitative studies with human subjects in the fields of counseling and psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: SPSY, CEP majors.

**C EP 636. Advanced Statistics****3 Credits**

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. Both hand calculation and computer packages will be employed. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 511 or equivalent course work.

**C EP 637. Multivariate Statistics****3 Credits**

Theories and techniques of multivariate statistics as applied to education and psychology. Includes multiple regression, logistic regression, MANOVA, factor analysis, and structural equation modeling. Computer packages will be the primary tool for data analysis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 636 or equivalent course work.

**C EP 642. Psychometrics****3 Credits**

An introduction to psychometrics, including topics such as theory and techniques of psychological measurement, scale and inventory construction, reliability, validity, evaluation of measurement quality, classical and contemporary measurement theory, and standardization. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. Restricted to: SPSY, CEP majors.

**C EP 647. Appraisal of Cognitive Functioning****3 Credits**

Taught with C EP 547 with differentiated assignments for doctoral students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**C EP 648. Appraisal of Personality****3 Credits**

Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**C EP 649. Behavioral Assessment & Intervention****3 Credits**

The course introduces basic concepts, methods, and applications of behavioral assessment and intervention. Students will learn how to conduct functional assessments of behavior and how to write behavior intervention plans. Methods appropriate for assessment and intervention of school-age children will be emphasized. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**C EP 651. Diagnosis and Treatment Planning****3 Credits**

Same as C EP 551 with differentiated assignments for Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**Prerequisite(s):** C EP 612 or consent of instructor.

**C EP 652. Career/Life Planning and Vocational Assessment****3 Credits**

Same as C EP 552 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**C EP 658. Child and Adolescent Counseling Theory and Technique****3 Credits**

Same as C EP 558 with differentiated assignments for Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 554 or C EP 673.

**C EP 662. Family Therapy Theory and Technique****3 Credits**

Taught with C EP 562 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Crosslisted with: C EP 572. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 554 or C EP 673.

**C EP 670. Behavioral Health Practicum****1-6 Credits**

An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: MSW, CEP, SPSY majors. S/U Grading (S/U, Audit).

**C EP 671. Consultation****3 Credits**

Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**Prerequisite(s):** C EP 647, C EP 505, or consent of instructor.

**C EP 672. Practicum in School Psychology: Psychoeducational****1-6 Credits**

Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Graded: S/U. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP, SPSY majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 647, C EP 505.

**C EP 673. Counseling Psychology Theory/Practicum****1-6 Credits**

Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP majors.

**Prerequisite(s):** Consent of instructor.

**C EP 675. Practicum in School Psychology: Psychological****1-6 Credits**

School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multifaceted, integrative, family assessments) expected of school psychologists. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: SPSY, CEP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 672 or consent of instructor.

**C EP 676. Field Experience in Educational Diagnostics****1-6 Credits (1-6)**

C EP 676 is designed to provide students with supervised school-based experiences and practices. The goal of the course is for students to master the competencies required for the delivery of academic services in the educational diagnostician role. The specific emphases in this course are placed on a data-based decision-making skills, psychoeducational assessment activities, and academic interventions. Under faculty and school-system staff supervisions, students will assume service delivery responsibilities and with increasing independence will respond to the diagnostic and intervention needs of students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP, SPSY majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 647, C EP 608, C EP 505, C EP 672.

**C EP 677. Group Work Theory/Practicum****1-6 Credits**

Application of theory in group work with clients and in supervising group leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CEP, SPSY majors.

**Prerequisite(s):** C EP 673.

**C EP 678. Advanced Counseling Psychology Practicum****1-6 Credits**

Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Graded: S/U. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Restricted to: CEP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 677.

**C EP 679. Supervision Theory and Practicum****1-6 Credits**

Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. May be repeated for a maximum of 6 credits. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP majors.

**Prerequisite(s):** C EP 675 or C EP 678; and consent of instructor.

**C EP 680. Internship in Counseling Psychology I****1-18 Credits**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. May be repeated for a maximum of 18 credits. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits. Restricted to: CEP majors.

**C EP 681. Advanced Multicultural School Psychology Field Experience****3 Credits**

Supervised school psychology field experience including appraisal diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation from a multicultural perspective with diverse populations. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. Restricted to: SPSY, CEP, C EP majors.

**Prerequisite(s):** C EP 672, C EP 675.

**C EP 682. Internship in Counseling Psychology II****1-18 Credits**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits. Restricted to: CEP majors.

**Prerequisite(s):** Consent of instructor.

**C EP 684. Internship in School Psychology****1-12 Credits (1-12)**

Supervised experience in school psychology. May be repeated for a maximum of 12 credits. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Restricted to: SPSY majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 672, C EP 675.

**C EP 685. Doctoral Internship in School Psychology****6-12 Credits (6-12)**

Supervised doctoral internship experience in school psychology. 1800 to 2000 clock hours are completed on a full-time basis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: SPSY, C EP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 672, C EP 675, C EP 681.

**C EP 693. Dissertation Seminar****3 Credits**

Same as ELA, EDUC, SPED 693. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP majors.

**C EP 698. Selected Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits. Restricted to: CEP majors.

**C EP 699. Ed.S. Thesis****1-15 Credits**

Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits. Restricted to: CEP majors. Thesis/Dissertation Grading.

**C EP 700. Doctoral Dissertation****15 Credits**

Dissertation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits. Restricted to: CEP, C EP majors. Thesis/Dissertation Grading.

**Name:** Norma Martinez Arrieta

**Office Location:** O'Donnell Hall, Suite 222

**Phone:** (575) 646-5485

**Website:** <http://cep.nmsu.edu>

## Counseling and Community Psychology - Bachelor of Science

*Minimum Upper Division Required (300+)=48 credits*

**General Education Requirements**

<i>Area I English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition <sup>3</sup>	4
Choose one of the following		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one of the following		3
COMM 253G	Public Speaking	
COMM 285	Survey of Communication Theory	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	

**Area II Mathematics**

MATH 121G	College Algebra (or higher) <sup>3</sup>	3
Choose one of the following		3
STAT 251G	Statistics for Business and the Behavioral Sciences <sup>3</sup>	
or A ST 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences <sup>3</sup>	

**Area III Laboratory Sciences (Must be "G" courses and include labs)**

Choose any two of the following		8
AGRO 100G	Introductory Plant Science	
or HORT 100G	Introductory Plant Science	
ASTR 105G	The Planets	
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
E S 110G	Introductory Environmental Science	
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	
PHYS 110G	The Great Ideas of Physics	
PHYS 120G	Introduction to Acoustics	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	

**Area IV Social/Behavioral Sciences**

C EP 110G	Human Growth and Behavior <sup>3</sup>	3
PSY 201G	Introduction to Psychology <sup>3</sup>	3
Choose one from the following		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
GOVT 160G	International Political Issues	

SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
W S 201G	Introduction to Women s Studies	
W S 202G	Representing Women Across Cultures	

**Area V Humanities and Fine Arts**

Choose one of the following		3
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 110G	Making History	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	
HIST 222G	Islamic Civilizations since 1800	
Choose one of the following		3
ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
ART 295G	Introduction to Art History I	
ART 296G	Introduction to Art History II	
DANC 101G	Dance Appreciation	
ENGL 244G	Literature and Culture	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
THTR 101G	The World of Theatre	

**Viewing a Wider World (C EP 330V and C EP 451V may not be used, second course cannot be from College of ACES)<sup>1</sup>**

FCS 449V	Family Ethnicities and Subcultures	
<b>Core Courses<sup>3</sup></b>		
C EP 210	Educational Psychology	3
C EP 215	The Preschool Child	3
C EP 240	Adolescence in School Settings	3
C EP 298	Exploration of Counseling & Community Psychology	3
C EP 300V	Human Relations Training	3
C EP 320	Sex Roles in Education	3
C EP 420	Introduction of Mindfulness Practice	3
C EP 451V	Introduction to Counseling	3
C EP 455	Addictions Prevention and Recovery	3
C EP 461	Family Guidance	3
C EP 495	Psychology, Multiculturalism and Counseling	3
C EP 498	Internship in Counseling & Community Psychology	6
C J 416	Global Perspectives on Youth and Drug Use	3
FCS 383	Parenting and Child Guidance	3
PHIL 223G	Ethics	3
FCSC 400	Research Methods in Family and Consumer Sciences	3

or PSY 310	Experimental Methods	
<b>Approved Electives</b> <sup>3</sup>		
Select sufficient electives from approved CEP Department list (https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology/) to meet 120 minimum credit hours for the Bachelor degree (minimum of 24 credits required). <sup>2</sup>		24
<b>Total Credits</b>		120

<sup>1</sup> C EP 300V Human Relations Training and C EP 451V Introduction to Counseling may not be used as a VWW.

<sup>2</sup> General electives are selected from required electives options.

<sup>3</sup> A grade of C- or better is required

## Counseling and Educational Psychology - Undergraduate Minor

A minor in Counseling and Educational Psychology (CEP) is available to the student receiving a bachelor's degree from another department in the university. The minor in CEP is designed to be useful to the undergraduate who is preparing to enter one of the helping professions such as psychology, education, social work, criminal justice or nursing. A total of 18 credits is required to obtain the CEP minor, of which, at least 9 credits must be at 300 level or above. Contact the CEP office for more information on the minor application process.

The Department of Counseling and Educational Psychology offers three graduate programs leading to the degrees of Master of Arts, Specialist in Education, and Doctor of Philosophy. Students must be admitted by the department into a graduate program to earn a degree in

- Clinical Mental Health Counseling (M.A.)
- School Psychology (Ed.S.)
- Counseling Psychology (Ph.D.)

Students interested in earning graduate degrees should consult the Graduate School Catalog for requirements and contact the CEP department for information on admissions and application requirements.

### Requirements

Select 18 credits of C EP electives from the following, with at least 9 credits of upper division (300 and above):		18
C EP 110G	Human Growth and Behavior	
C EP 210	Educational Psychology	
C EP 215	The Preschool Child	
C EP 240	Adolescence in School Settings	
C EP 298	Exploration of Counseling & Community Psychology	
C EP 300V	Human Relations Training	
C EP 320	Sex Roles in Education	
C EP 420	Introduction of Mindfulness Practice	
C EP 451V	Introduction to Counseling	
C EP 455	Addictions Prevention and Recovery	
C EP 461	Family Guidance	
C EP 495	Psychology, Multiculturalism and Counseling	
C EP 499	Independent Study	
<b>Total Credits</b>		18

## Clinical Mental Health Counseling - Master of Arts

The CEP department offers a Clinical Mental Health Counseling program which leads to a Masters of Arts degree (M.A.). The program is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). It prepares professional counselors to perform mental health counseling in agencies, hospitals, and private practice. Successful completion of the Clinical Mental Health Counseling program qualifies students to pursue licensure as clinical mental health counselors with the New Mexico Counseling and Therapy Practice Board. The 60-credit counseling curriculum requires two years full-time study or three years part time study on campus, and covers the following areas: human development, appraisal; diagnosis and treatment planning; individual, family and group counseling; consultation; career/life planning; research; and professional issues. Specialized training and supervised experience is offered in mental health agencies, hospitals, and in schools.

Annual application deadline: February 1

## Clinical Psychopharmacology - (Postdoctoral) Master of Science

The curriculum for the Postdoctoral Master of Science in Clinical Psychopharmacology degree program is modeled on the American Psychological Association (APA) recommended curriculum adopted in 1998 from the Blue Ribbon Task Force (comprised of national experts in psychopharmacology including physicians, psychiatrists, Department of Defense Demonstration Project prescribing psychologists, neuroscientists, pharmacists and nurses). In addition, the NMSU program adheres to all regulations set forth by the New Mexico Board of Psychologist Examiners and the New Mexico Board of Medical Examiners and is designed in congruence with New Mexico state law for prescribing psychologists. The program is dynamic, changing with the field, and has been modified according to recommended revisions of the American Psychological Association in 2009. The M.S. in Clinical Psychopharmacology degree program is an APA Designated Postdoctoral Psychopharmacology Education and Training Program.

### Admission Application:

Admission requirements for the Clinical Psychopharmacology program are consistent with those of the Graduate School. However, in addition to these requirements, all master's degree applicants must provide, to the department, a letter of application indicating intent for wanting to pursue a master's degree in the department; a professional résumé; official verification of good standing from that state's Board of Psychology, including three years of licensed professional practice with no ethical violations. The CEP admissions committee bases graduate admission referrals on this portfolio and will not consider incomplete applications.

### Prerequisites:

Students interested in Clinical Psychopharmacology must have a doctorate degree in Psychology or Counseling Psychology, and a current unrestricted state license in good-standing for a minimum of 3 years.

### Application Deadline:

For application and coursework details, please contact the CEP department office or visit the M.S. in Clinical Psychopharmacology

degree program website at: <https://cep.nmsu.edu/academic-programs/clinical-psychopharmacology/>

## Counseling Psychology - Doctor of Philosophy

The CEP Department offers a doctoral Counseling Psychology program that leads to a Ph.D. in Counseling Psychology. The program is accredited by the American Psychological Association. For more information on this accreditation contact

The Office of Program Consultation and Accreditation  
American Psychological Association  
750 1st Street, NE  
Washington, DC 20002  
Phone: (202) 336-5979.

The program is based on the scientist-practitioner model through which both research and service delivery skills are acquired. Graduates of the program are prepared to conduct research, provide service, teach and supervise. The program prepares students for licensure as psychologists. The two aims of the program are:

1. To prepare entry level counseling psychologists who are self-reflective and competent in both the practice and science of the profession.
2. To prepare counseling psychologists who think critically about the sociocultural context of their work and promote social justice.

Annual application deadline: December 15

## Program Requirements

CEP faculty conduct periodic reviews of students' progress in the programs, including their academic performance, counseling and psychoeducational skills, professionalism and ethics. Deficits identified through faculty reviews may result in recommendations that students engage in remedial work or that they pursue alternative career goals. For more information about the CEP Department and programs visit our website: <http://cep.nmsu.edu>.

## School Psychology - Specialist in Education

The CEP Department offers a School Psychology program that leads to a Specialist in Education (Ed. S.) degree. The program is accredited through the National Association of School Psychologists. The program provides additional education beyond the M.A. to prepare professionals for licensure as school psychologists in New Mexico and throughout the United States. The School Psychology program prepares its candidates to work with preschoolers, children, adolescents and families. The various settings where School Psychologists are employed include public schools and other organizations that require advanced assessment, counseling, consultation and other interventions. The program trains its candidates to serve students with diverse educational, psychological and emotional needs from various backgrounds. Such training also includes working with all school personnel to help make education a positive and rewarding experience for their students. Students admitted to the School Psychology program also have the opportunity to achieve a Masters degree in Counseling and Guidance with a concentration in Educational Diagnostics on the way to obtaining the specialist degree.

Students would need to complete additional curricular, field experiences and degree requirements.

Annual application deadline: January 15

## Integrated Behavioral Health Care - Graduate Minor

The Minor in Integrated Behavioral Health Care, offered through the Counseling and Educational Psychology (CEP) department, is open to graduate students enrolled in CEP programs Clinical Mental Health Counseling, School Psychology, Counseling Psychology and to graduate students who are enrolled in Social Work, Public Health, Nursing and Marriage and Family Therapy programs.

It was established in the interest of meeting the needs of graduate students in the health professions who are receiving, or seeking training in, interdisciplinary or interprofessional collaborations with other healthcare disciplines. The provision of integrated behavioral health services fits within the university's broader goal of meeting the needs of the citizens of New Mexico and the department's commitment to graduating competent service providers who can be effective members of a health care team.

Students will successfully complete 9 credits of coursework specific to this program of study in order to obtain a Minor in Integrated Behavioral Health Care. For application and coursework details, please contact the CEP department office or visit the departmental website at <https://cep.nmsu.edu>.

Through the courses in this minor students develop knowledge and skills in the following areas:

1. Apply the biopsychosocial model of health and illness with primary care patients,
2. Apply knowledge regarding the mind-body connection to address such issues as stress management, emotion regulation and sleep medicine,
3. Apply culturally responsive behavioral assessment/interventions,
4. Demonstrate behavioral health consultation skills with other health care providers, and
5. Develop interprofessional collaboration skills that include understanding the roles of all healthcare professionals and learning how to communicate effectively in order to engage in service delivery as a team.

## Spanish Counseling - Graduate Minor

The Minor in Spanish Counseling, offered through the Counseling and Educational Psychology department is open to graduate students who are enrolled in CEP graduate programs including Clinical Mental Health Counseling, School Psychology, Counseling Psychology and also to graduate students who are enrolled in Social Work and Marriage and Family Therapy programs. It was established in the interest of meeting the needs of bilingual counseling students who seek training in the provision of Spanish language mental health services.

Students will successfully complete 9 credits of coursework specific to this program of study in order to obtain a Minor in Spanish Counseling. Courses will be taught by culturally competent faculty, adjunct professors, or community mental health professionals in the

mentioned disciplines. Students will choose one course from each of the following components:

1. Counseling language development
2. Clinical experiences
3. Sociocultural experiences.

Students must currently be enrolled in a Mental Health program as described above. They must demonstrate intermediate level Spanish language skills as evidenced by the Spanish Placement Exam and an oral interview with the program coordinator. Advanced level in Spanish counseling skills is required for the completion of the Minor. If a student feels that he/she needs to improve his/her level of academic Spanish prior to completing the required coursework, or if the program coordinator determines that it is necessary, the student has the option of taking additional Spanish courses through the Languages and Linguistics department (e.g. SPAN 312 Grammar for Heritage/Native Speakers of Spanish, SPAN 313 Spanish Grammar, SPAN 314 Spanish Composition, and SPAN 315 Composition for Heritage/Native Speakers of Spanish). Students will be required to take Spanish language courses until they have satisfied this requirement. Please note that online courses will not fulfill this requirement. For application and coursework details, please contact the CEP department office or visit the departmental website at <https://cep.nmsu.edu>.

## Curriculum and Instruction

### Undergraduate Program Information

#### Professional Education Courses

All students are required to take prerequisite courses before application to the Teacher Education Program.

Students seeking teacher licensure must meet all Teacher Education Program requirements. Those requirements including prerequisite courses must be passed with a C- or better, a GPA of 2.5 for undergraduates and 3.0 for graduate students seeking a MA plus licensure, passing scores on basic and general portions of the NES Teacher Exam, and satisfying the requirements for the academic teaching field. Each student must possess the academic ability, character and attitude suitable for teaching. Students who, in the professional judgment of the faculty and staff, do not possess these qualifications may be examined by a Selective Review Committee. The committee may recommend a variety of actions, ranging from remedial procedures to withdrawal from the Teacher Education Program.

#### Competitive Admission Process for Teacher Licensure

Applicants who successfully meet the minimum requirements for admission will be reviewed by the Teacher Education Program admission committee. The admission committee will base admission decisions on applicants' academic qualifications, basic skills test scores, written communication, faculty recommendations for the student, dispositions and the student's portfolio.

Applicants should be aware that admission to the Teacher Education Program is competitive and is based upon available faculty resources. Posted GPA and basic skills test scores are the minimum necessary to be considered for admission to the Teacher Education Program and do not ensure admittance into programs. Applicants are encouraged to develop a strong student portfolio, achieve the highest GPA possible and present a professional portfolio.

## Graduate Program Information

The Department of Curriculum and Instruction is devoted to the preparation of master educators for public, private and governmental institutions. Graduates are prepared to serve as directors of instruction and curriculum, subject matter specialists, supervisors of student teaching and college professors of curriculum and instruction.

Five degree programs are available:

1. Master of Arts (in education),
2. Master of Arts in Teaching,
3. Specialist in Education,
4. Doctor of Education in curriculum and instruction, and
5. Doctor of Philosophy in curriculum and instruction.

The Master of Arts requires a concentration in curriculum and instruction. Six areas of concentration are offered:

1. curriculum and instruction,
2. bilingual education,
3. early childhood education,
4. educational learning technologies,
5. language, literary & culture, reading, and
6. TESOL.

Coursework may be taken in elementary education, secondary education, TESOL, curriculum development, instructional techniques, instructional technology, advanced methodology, multicultural education and teaching fields or endorsement areas.

At the master's degree level, non-thesis option, the department requires a final examination. This written examination is administered once each semester (fall, spring, and summer II). Detailed information about the written exam is available in the Master's Handbook (<http://https://ci.nmsu.edu/programs/graduate-programs/candi-handbooks/>) and on the departmental webpage (<http://ci.nmsu.edu>).

The Ph.D. and Ed. D have a theoretical-research orientation. Every doctoral student (Ph.D. and Ed.D.) is required to take a 12-credit research block that includes EDUC 613 Evaluation of Quantitative Research in Education and EDUC 576 Qualitative Research. Furthermore, students enrolled in the Ph.D. program must complete 6 credits in either computer tools courses or the foreign language sequence.

A master's degree, a cumulative GPA of 3.0 or better in graduate work, and three years of teaching experience or the equivalent are required for admission to doctoral programs in curriculum and instruction. Applicants should be aware that admission to the doctoral program is competitive and based on available departmental resources and available faculty resources and interest.

Doctoral-level qualifying exams are held during the spring semester.

Particulars with regard to procedural requirements relating to the degree are available by visiting the departmental website: <https://ci.nmsu.edu/>

#### General Admission to Graduate Programs

The Department of Curriculum and Instruction requires graduate students who have completed 9 credits under the "undeclared" category in the Graduate School and/or nondegree status to be admitted into a graduate degree program either in Curriculum and Instruction or any other graduate department in the College of Education. The department will

dis-enroll any student who has not been admitted into a graduate degree program (after completing 9 credits) and additionally, will not allow them to enroll or attend in other Curriculum and Instruction coursework.

## Degrees for the Department

Early Childhood - Bachelor of Science in Education (p. 490)

Elementary Education - Bachelor of Science in Education (p. 491)

Secondary Education - Bachelor of Science in Education (p. 493)

Education - Master of Arts (p. 499)

Education - Master of Arts in Teaching (p. 500)

Curriculum and Instruction - Doctor of Education (p. 500)

Curriculum and Instruction - Doctor of Philosophy (p. 501)

## Minors for the Department

Early Childhood Education - Undergraduate Minor (p. 498)

**Associate Professor, David Rutledge, Interim Department Head**

**Directors:** B. Araujo, *Elementary Education*; T. Gorham Blanco, *Secondary Education*; E. Cahill, *Early Childhood*; C. Hernandez, *Secondary Alternative Licensure*; D. Rutledge *Interim Department Head/Graduate Studies*

**Professors** Baptiste, Haynes Writer, A. Hernandez, Torres; **Associate Professors** Araujo, Cahill, Charles-Huerta, Reyes, Rutledge, Salazar Perez; **Assistant Professors** Engledowl, Fahrenbruck, Flores Carmona, Ciblis, Lucero, Marlett, Pando, Parra, Woodley; **College Instructors** Bagwell, Gorham Blanco, C. Hernandez

B. Araujo, Ph.D. (New Mexico State University)– critical pedagogy, bilingual education; H. P. Baptiste, Ed.D. (Indiana University)– science elementary; E. Cahill, Ph.D. (Kent State University)– early childhood education; C.Engledowl, Ph.D. (University of Missouri) - mathematics education; J.Flores-Carmona, Ph.D. (University of Utah) - culture and society, sociology of education; L. Cibils, Ph.D. (New Mexico State University)– TESOL, bilingual education, language teaching; M. L. Fahrenbruck, Ph.D. (University of Arizona)– language, reading & culture; J. L. Haynes Writer, Ph.D. (University of New Mexico)– critical multicultural & social justice education, Indigeneity, Native American education teacher preparation; A. Hernandez (Stanford University)– elementary literacy, sociolinguistics, biliteracy-multiliteracy, and teacher professional development; C.M. Hernandez, Ph.D. (Kansas State University)– science education; L. Huerta-Charles, Ph.D. (New Mexico State University)– multicultural/bilingual education; L. Lucero (University of Texas-El Paso)– teaching, learning, and culture, math, science, technology; R. Marlett, Ph.D. (University of Nebraska-Lincoln) - language, literacy and culture; M. Pando, Ph.D. (Texas Tech University) - bilingual education; J. L. Parra, Ed.D. (Pepperdine University)– online teaching & learning; technology integration; teacher/ faculty professional development, innovative & transformative education; L. V. Reyes, Ph.D. (New Mexico State University)– early childhood education and critical pedagogy; D. Rutledge, Ph.D. (University of Colorado-Boulder)– learning technologies, international education, bilingual education/ TESOL; M. Salazar Perez, Ph.D. (Arizona State University) - early childhood; M. Torres, Ph.D. (University of New Mexico)– sociocultural and psychological foundation; X. Woodley, Ph.D. (New Mexico State University)– educational learning technology, critical pedagogy.

## Early Childhood Education Courses

### ECED 115. Child Growth, Development, and Learning

#### 3 Credits

This basic course in the growth, development, and learning of young children, prenatal through age eight, provides students with the theoretical foundation for becoming competent early childhood professionals.

### ECED 125. Health, Safety, and Nutrition

#### 2 Credits

This course provides information related to standards and practices that promote children's physical and mental well being sound nutritional practices, and maintenance of safe learning environments.

### ECED 135. Family and Community Collaboration

#### 3 Credits

This beginning course examines the involvement of families and communities from diverse cultural and linguistic backgrounds in early childhood programs. Ways to establish collaborative relationships with families in early childhood settings is discussed.

**Prerequisite(s):** ECED 115 and ENGL 111G.

### ECED 215. Curriculum Development Through Play

#### 3 Credits

The beginning curriculum course places play at the center of curriculum in developmentally appropriate early childhood programs. It addresses content that is relevant for children birth through age four and developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with diverse abilities and the development of IFSP's and IEP's is included. Consent of instructor required.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**Corequisite(s):** ECED 220.

### ECED 220. Early Childhood Education Practicum I

#### 2 Credits

The beginning practicum course will provide experiences that address curriculum content that is relevant for children birth through age four in developmentally and culturally sensitive ways. Consent of instructor required.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**Corequisite(s):** ECED 215.

### ECED 225. Curriculum Development and Implementation II

#### 3 Credits

The second curriculum course focuses on developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills, is emphasized. Information on adapting content areas to meet the needs of children with diverse abilities and the development of IEP's is included. Consent of instructor required.

**Prerequisite(s):** ECED 115, ENGL 111G.

**Corequisite(s):** ECED 230.

### ECED 230. Early Childhood Education Practicum II

#### 2 Credits

The second field-based curriculum course focuses on practicing developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Consent of instructor required.

**Prerequisite(s):** ECED 115, ENGL 111G,.

**Corequisite(s):** ECED 225.

**ECED 235. Introduction to Language, Literacy and Reading****3 Credits**

This course is designed to prepare early childhood professionals for promoting children's emergent literacy and reading development. Through a developmental approach, the course addresses ways in which early childhood professionals can foster young children's oral language development, phonemic awareness, and literacy problem solving skills, fluency, vocabulary, and comprehension.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**ECED 245. Professionalism****2 Credits**

This course provides a broad-based orientation to the field of early care and education. Early childhood history, philosophy, ethics and advocacy are introduced. Basic principles of early childhood systems are explored. Multiple perspectives on early care and education are introduced. Professional responsibilities such as cultural responsiveness and reflective practice are examined.

**ECED 255. Assessment of Children and Evaluation of Programs****3 Credits**

This basic course familiarizes students with a variety of culturally appropriate assessment methods and instruments, including systematic observation of typically and non-typically developing children. Crosslisted with: SPED 255

**Prerequisite(s):** ECED 115 and ENGL 111G.

**ECED 265. Guiding Young Children****3 Credits**

This course explores various theories of child guidance and the practical applications of each. It provides developmentally appropriate methods for guiding children and effective strategies and suggestions for facilitating positive social interactions. Strategies for preventing challenging behaviors through the use of environment, routines and schedule will be presented.

**ECED 270. Program Management****3 Credits**

Technical knowledge necessary to develop and maintain a quality early care and education program. The course will focus on sound financial management and vision, laws and legal issues that affect programs and state and national standards including accreditation requirements.

**Prerequisite:** consent of instructor.

**ECED 275. Curriculum for Diverse Learners and Their Families****3 Credits**

Implementation of family-centered programming that includes developmentally appropriate and culturally responsive curriculum. The course will also cover the establishment and maintenance of healthy and safe learning environments. Consent of instructor required.

**ECED 276. Effective Program Development for Diverse Learners and Their Families****2 Credits**

Practical experience in observing and carrying out the role of the director/administrator in the implementation of family-centered programming that includes individually appropriate and culturally responsive curriculum in a healthy and safe learning environment. Consent of instructor required. Restricted to ECED majors.

**Corequisite(s):** ECED 275.

**ECED 280. Professional Relationships****3 Credits**

Development of staff relationships that will foster strong professional relationships with and among families, communities and advisory boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Working effectively with board, advisory groups and community members and agencies will be addressed. Consent of instructor required.

**Corequisite(s):** ECED 281.

**ECED 281. Professional Relationships Practicum****2 Credits**

Practical experience in the development of staff relationship that will foster professional relationships with families, communities and boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Consent of instructor required. Restricted to ECED majors.

**Corequisite(s):** ECED 280.

**ECED 315. Research in Child, Growth, Development and Learning****3 Credits**

This advanced course in child growth, development, and learning builds upon the foundational material covered in the basic course in child growth, development, and learning. An integration of major theories of child development is provided by focusing on contemporary research in all aspects of development, including bio-ecological, social-affective, cognitive, language, and the methodological aspects of research in early childhood development and education. May be repeated up to 3 credits. Restricted to: TEP-ECED majors.

**Prerequisite(s):** ECED 115.

**ECED 329. Early Primary Field Placement****2 Credits**

The field practicum is a co-requisite course with Teaching and Learning Reading and Writing; Teaching and Learning Math and Science; Teaching and Learning Social Studies, Fine Arts and Movement. The field based component will provide experiences that address curriculum content and practice teaching that is relevant for early primary children in developmentally and culturally sensitive ways. Graded: S/U. May be repeated up to 2 credits. Restricted to: TEP-ECED majors. S/U Grading (S/U, Audit).

**Corequisite(s):** ECED 440, ECED 455, RDG 350.

**ECED 335. Family, Language and Cultural****3 Credits**

This course analyzes the interrelationships between family, language, and culture as connected to children's development and learning. In this course, language is understood as a human activity and higher mental process which build on the children's families, community and cultural background. May be repeated up to 3 credits. Restricted to: TEP-ECED majors.

**Prerequisite(s):** ECED 135.

**ECED 351. Emergent Literacy****3 Credits (2+2P)**

This advanced course is designed to prepare early childhood professionals to study literacy development, specifically oral language, writing and reading. This course focuses on children from birth through age 4, including children with special needs. Through a developmental approach, the course addresses: 1) recent theory and research that translates into practical strategies, assessment materials and preparation of rich literacy environments, 2) the socio-cultural contexts in which children develop literacy, 3) culturally, linguistically and developmentally appropriate literacy curricula, 4) processes used to determine the appropriateness of various literacy strategies, 5) assessment, evaluation, and accountability and 5) literacy leadership. Crosslisted with: RDG 351.

**Prerequisite(s):** ECED 235.

**ECED 395. Special Topics****1-3 Credits**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits.

**ECED 420. Integrated Early Childhood Curriculum****4 Credits**

This advanced course focuses on developmentally appropriate content, learning environments, and curriculum implementation for children birth through age 4. It emphasizes integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children.

**Prerequisite(s):** ECED 125, ECED 215, ECED 220, ECED 225, ECED 230, ECED 245, and ECED 265.

**Corequisite(s):** ECED 425.

**ECED 425. Integrated Curriculum Practicum****2 Credits**

The advanced practicum course is a field based course that will provide opportunities for the integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children.

**Prerequisite(s):** ECED 125, ECED 215, ECED 220, ECED 225, ECED 230, ECED 245, ECED 265.

**Corequisite(s):** ECED 420.

**ECED 440. Teaching and Learning Math and Science****4 Credits (2+4P)**

Standards, principles, and practices in teaching mathematics and science to young children in preschool through grade 3. An emphasis is placed on developing a content-rich integrated math and science curriculum that focuses on children's development and interests, includes appropriate content, processes, environment, and materials with an emphasis on problem-solving as the major means of constructing basic concepts. Field experience required. May be repeated up to 4 credits. Restricted to: TEP-ECED majors.

**ECED 443. Assessment of Children and Evaluation of Programs****3 Credits**

Advanced course builds on understanding the connections among learning, teaching, and assessment and strategies for evaluating programs. Assessment, identification, and monitoring of typical and atypical development in the cognitive, motor, affective and social domains. Multiple and diverse assessment approaches, including responsiveness to cultural and linguistic differences will be emphasized. Builds upon indicators of competence established at the lower division (AA) level. For each course objective (core competency) students will demonstrate the indicators established for the bachelor s level.

**ECED 452. Teaching Language Minority Children in Early Childhood Settings****3 Credits**

Framework and strategies for the educational development of young language-minority children.

**ECED 455. Teaching and Learning Social Studies, Fine Arts and Movement****3 Credits (2+2P)**

The course focuses on the aims, scope, and integration of methods of teaching social studies, the fine arts and movement across the curriculum. This course emphasizes an integrated approach to teaching the what and why of social studies; assessing student learning; planning units, lessons, and activities; effective instructional strategies; and knowledge of social studies content. Concepts of expressive art include the visual arts, music, movement and drama. May be repeated up to 3 credits. Restricted to: TEP-ECED majors.

**Corequisite(s):** ECED 329, ECED 440, RDG 350.

**ECED 458. Field Experience (Infants Pre-K)****1 Credit**

Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. Graded S/U.

**ECED 459. Field Experience (K-3)****1 Credit**

Supervised field experiences in early childhood settings: public school programs K 3. Graded S/U.

**ECED 465. Advanced Caregiving for Infants and Toddlers****3 Credits**

The advanced field-based course is intended to assist students to define and implement advanced elements of quality programming for all infants, toddlers in safe, healthy, responsive caring environments. The experiences in the approved setting will support strong nurturing relationships, cultural competence, diverse learning needs and styles of every child, appropriate guidance techniques and partnership with the families, cultures, and community represented. Students are assisted through the course in advancing their ability to observe, discuss, and implement elements of quality programming for infants and toddlers in home, small-group or whole-group care situations. Crosslisted with: SPED 465

**ECED 470. Student Teaching/Seminar****6 Credits**

Provides student teaching experience in a variety of settings with young children ages birth 8. May be repeated up to 6 credits. Restricted to: TEP-ECED majors.

**ECED 479. Curriculum in Early Childhood Education****3 Credits**

Development and implementation of curriculum and materials for teaching young children.

**ECED 489. Topics****3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated three times for a maximum of 9 credits.

**ECED 510. Issues in Early Childhood Education****3 Credits**

Examines current trends and problems through readings of theoretical, empirical, and applied literature.

**ECED 515. Working with Parents of Young Children****3 Credits**

Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs.

**ECED 520. Seminar on Cognitive and Social Development****3 Credits**

In-depth study of developmental theories: Piaget, Kohlberg, Bruner, and Erikson. Implications for development of preschool programs and teaching techniques.

**ECED 530. Leadership and Advocacy in Early Childhood****3 Credits**

The course explores a multidisciplinary approach to early childhood educational leadership, advocacy and change. The course focuses on leadership in its many forms: in teaching, administration, policy, research, and ethics. In addition, we will examine the theory and practice of change to gain an understanding of what contributes to advocating for policy and community change. Students will gain a deeper understanding of themselves as leaders, and ways to improve early education to promote social justice in programs and systems serving families and young children.

**ECED 570. Play in the Early Childhood Curriculum****3 Credits**

Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. Same as ECED 451 with differentiated assignments for graduate students.

**ECED 612. History and Philosophy of Early Childhood Education****3 Credits**

Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major.

**ECED 614. Early Childhood, Communities, and Social Policy****3 Credits**

Early childhood politics and policy taken from a global, national, state, and community context. Restricted to doctoral-level students of any major.

**ECED 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, EDUC 633, RDG 633, EDLT 633.

**ECED 698. Selected Topics in Early Childhood Education****1-6 Credits**

Offered under various subtitles. May be repeated for a maximum of 6 credits. Restricted to doctoral-level students of any major.

## Education Courses

**EDUC 101. Freshman Orientation****1 Credit**

Introduction to the university and to the College of Education. Discussion of planning for individualized education program and field experience. Restricted to Las Cruces campus only.

**EDUC 102. Internship I****3 Credits**

Supervised experience in elementary education settings.

**EDUC 103. Introduction with Internship in Bilingual Education/ESL****3 Credits**

An overview of the American Education system with emphasis on organization, governance, law, demographics, and professional practice. Will include supervised experience in bilingual education/ESL elementary settings for prospective bilingual education/ESL teachers.

**EDUC 150. Math for Paraprofessionals****3 Credits**

Applied math skills for paraprofessionals working with children.

**Prerequisite:** CCDM 103.

**EDUC 151. Math for Paraprofessionals II****3 Credits**

Applied math skills for paraprofessionals working under the direction of a teacher.

**Prerequisite:** EDUC 150.

**EDUC 181. Field Experience I****1 Credit**

Introduction to public school teaching, school visits, classroom observations and discussion seminar.

**EDUC 195. Individual Topics in Education****1-3 Credits**

Supervised study in a specific area of interest. Each course shall be designated by a qualifying subtitle. May be repeated for a maximum of 9 credits.

**EDUC 202. Internship II****3 Credits**

Supervised experience in junior high settings.

**Prerequisite:** must be a co-op student.

**EDUC 204. Foundations of Bilingual/ESL Education****3 Credits**

Explore and review the historical, legal, philosophical, theoretical and pedagogical paradigms of bilingual/ESL education.

**EDUC 219. Pre-Teacher Preparation****3 Credits**

Assists students in developing the necessary competencies needed for acceptance to the Teacher Education Program. Course content includes basic skill development, test taking skills, and completion of teacher preparation packet. Maybe repeated for a maximum of 6 credits. Graded S/U. Community Colleges only.

**EDUC 250. Introduction to Education****2 Credits**

An overview of the American education system with emphasis on organization, governance, law, demographics, and professional practice. Restricted to Las Cruces campus only.

**EDUC 281. Introduction to Secondary Education and Youth****3 Credits**

Introductory course for students considering a career in secondary education. Includes historical, philosophical, and sociological foundations, program organization, critical dispositions, and understanding the context of schools and youth. Practicum required. Restricted to: Secondary Ed majors. Traditional Grading with RR.

**EDUC 302. Internship III****3 Credits**

Student teaching in public school classroom according to major area of interest.

**EDUC 303. Secondary Bilingual/ESL Field Experience****3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Same as EDUC 381. Crosslisted with: EDUC 381.

**EDUC 315. Multicultural Education****3 Credits (2+2P)**

The conceptual manifestations of culture, race and ethnicity, class, gender, sexual orientation, exceptionalities, language, bilingualism, and global citizenship within the schooling process. May be repeated up to 3 credits. Crosslisted with: EDUC 317V.

**EDUC 317V. Multicultural Issues in Society****3 Credits**

Conceptual manifestations of culture, race, ethnicity, class, gender, exceptionalities, language, and bilingualism within and across society. Crosslisted with: EDUC 315.

**EDUC 342. Sheltered English Instruction for the ESL Classroom****3 Credits**

Addresses the acquisition of English proficiency by speakers of other languages.

**EDUC 343. Language, Literacy, and Culture in the ESL Classrooms****3 Credits**

Framework and strategies for developing the written abilities of second language learners.

**EDUC 344. Issues in Schooling for Bilingual Learners****3 Credits**

Current thought and direction regarding bilingual education in the United States and New Mexico.

**EDUC 381. Secondary Field Experience****3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Same as EDUC 303. Crosslisted with: EDUC 303.

**EDUC 395. Special Topics in Education****1-3 Credits**

Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 cr. per semester and a total of 6 credits overall.

**EDUC 402. Internship IV****6 Credits**

Supervised co-teaching in educational setting according to major area of interest.

**Prerequisite:** must be a co-op student.

**EDUC 451. Methods of Teaching Elementary School Science****3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**Prerequisite(s):** 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department.

**EDUC 452. Methods of Teaching Elementary School Mathematics****3 Credits (2+2P)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**Prerequisite(s):** MATH 111.

**EDUC 454. Methods of Teaching Elementary School Social Studies****3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**EDUC 460. Teaching Language Arts at the Middle and High School Level****3 Credits (2+2P)**

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 560. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 461. Teaching Social Studies at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Same as EDUC 561. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 462. Teaching Mathematics at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Same as EDUC 562. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 463. Teaching Science at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Same as EDUC 563. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 464. Teaching Foreign Language at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in foreign language. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of foreign language for students in grades 6-12. Practicum required. Same as EDUC 564.

**EDUC 470. Elementary Student Teaching****9 Credits (9)**

Synthesis of knowledge and skills appropriate to teaching in elementary schools. May be repeated up to 9 credits. Restricted to: TEP-EED majors. S/U Grading (S/U, Audit).

**EDUC 471. Secondary Student Teaching****9 Credits (9)**

Synthesis of knowledge and skills appropriate to teaching in secondary schools. May be repeated up to 9 credits. Restricted to: TEP-SED majors. S/U Grading (S/U, Audit).

**EDUC 475. Contemporary Issues in Education****3 Credits (2+2P)**

Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. Requires field experience component in a school or community setting. Same as EDUC 575. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 480. International Student Teaching Seminar****1 Credit**

Preparation for students planning to teach in an international setting.

**Prerequisite:** Must be scheduled one semester before graduation.

**EDUC 481. Elementary Student Teaching Seminar****3 Credits (3)**

Discussion of elementary school issues related to student teaching. Taken concurrently with EDUC 470. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**EDUC 482. Middle and High School Student Teaching Seminar****3 Credits (3)**

Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 471. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 483. Second Language Acquisition****3 Credits**

Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. Same as EDUC 583.

**EDUC 487. Methods of TESOL****3 Credits**

Effective second language teaching approaches that provide for interactive learning situations, meaningful input language models, varied language use materials, adaptive teacher response strategies, and assessments of student processing needs.

**EDUC 489. Topics****1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: TEP-SPED majors.

**EDUC 495. Directed Study Courses in Education****1-3 Credits**

Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits.

**EDUC 501. Special Topics****1-3 Credits**

Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.

**EDUC 504. Adult and Family Literacy in TESOL****3 Credits**

An exploration of the theoretical, programmatic, and curricular frameworks for English language learners and their families. Focus on the development of culturally responsive and pedagogically sound literacy programs. Same as RDG 504.

**EDUC 505. Classroom Management****3 Credits**

Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations.

**EDUC 509. Teaching Methods Laboratory****3 Credits**

Practical application of previously learned content.

**Prerequisite(s):** Bachelors degree and admission to the Graduate School and departmental special program.

**EDUC 510. Internship/Student Teaching****6 Credits**

Integrated with EDUC 509. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary. Graded S/U.

**Prerequisite:** EDUC 509.

**EDUC 515. Multicultural Education****3 Credits (2+2P)**

Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Same as EDUC 315 with differentiated assignments for graduate students.

**EDUC 516. Curriculum and Pedagogy I****3 Credits**

Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings.

**EDUC 518. Technology and Pedagogy****3 Credits**

Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**EDUC 519. Research in Curriculum and Pedagogy****3 Credits**

An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research.

**EDUC 520. Action Research Projects****3 Credits**

Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency.

**Prerequisite(s):** EDUC 515, 516, 518 & 519.

**EDUC 530. Exploration in Education****3 Credits (2+2P)**

Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.

**EDUC 537. Independent Readings****1-3 Credits**

Each project will be designated by a qualifying subtitle.

**EDUC 550. Methods of Teaching Early Childhood Education****3 Credits**

Characteristics of the young child, play, guidance, communication, methods, materials, models, issues. Same as EDUC 450 with differentiated assignments for graduate students.

**EDUC 551. Methods of Teaching Elementary School Science****3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Same as EDUC 451 with differentiated assignments for graduate students.

**Prerequisites:** 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department.

**Corequisites:** ECED 550, EDUC 552, and RDG 560 (block A course).

**EDUC 552. Methods of Teaching Elementary School Mathematics****3 Credits (2+2P)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Same as EDUC 452 with differentiated assignments for graduate students.

**Prerequisite:** MATH 111.

**Corequisites:** ECED 550, EDUC 551, and RDG 560 (block A course).

**EDUC 553. Methods of Teaching Elementary School Language Arts****3 Credits (2+2P)**

Implications of language acquisition and development for instructional practices. Focus on student-centered response to literature, writing process, whole language learning, based on socio-psycholinguistic theory and research. Same as EDUC 453 with differentiated assignments for graduate students.

**Corequisites:** EDUC 554, EDUC 555, and RDG 561 (block B course).

**EDUC 554. Methods of Teaching Elementary School Social Studies****3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Same as EDUC 454 with differentiated assignments for graduate students.

**Corequisites:** EDUC 553, EDUC 555, and RDG 561 (block B course).

**EDUC 557. Science and Math Methods: Internship****3 Credits**

Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction for mathematics and science. University supervision provided simultaneously with EDUC 557. Restricted to CI and HSS non-degree students.

**EDUC 558. Social Studies/Language Arts Methods Internship****3 Credits**

Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 558. Restricted to CI and HSS non-degree students.

**EDUC 560. Teaching Language Arts at the Middle and High School Level****3 Credits (2+2P)**

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 460 with differentiated assignments for graduate students. Prerequisite(s): TEP required EDUC 515 & EDUC 530.

**EDUC 561. Teaching Social Studies at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 461 with differentiated assignments for graduate students. Prerequisite(s): TEP required EDUC 515 & EDUC 530.

**EDUC 562. Teaching Mathematics at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as 462 with differentiated assignments for graduate students.

**Prerequisite(s):** TEP required EDUC 515 & EDUC 530.

**EDUC 563. Teaching Science at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students.

**Prerequisite(s):** TEP required EDUC 515 & EDUC 530.

**EDUC 567. Teaching Business Education at the Middle and High School Level****3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in business education. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of business education for student in grades 6-12. Practicum required. Same as EDUC 467 with differentiated assignments for graduate students.

**Prerequisite(s):** TEP required EDUC 515 & EDUC 530.

**EDUC 575. Contemporary Issues in Education****3 Credits (2+2P)**

Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. The class will require a field experience component in a school or community setting. Taught with EDUC 475 with differentiated assignments for graduate students.

**EDUC 576. Qualitative Research****3 Credits**

Introduction to qualitative research methodologies from problem formulation to interpretation of results.

**EDUC 583. Second Language Acquisition****3 Credits**

Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. Appropriate for public school and adult educators. Same as EDUC 483.

**EDUC 587. Pedagogy of TESOL****3 Credits**

Overview of approaches that provide for interactive, culturally responsive pedagogy for students acquiring English. Emphasis on development of ESL literacy. Appropriate for public school and adult educators. Same as RDG 587.

**EDUC 590. TESOL Practicum****3 Credits**

Classroom applications of ESL literacy development through supervised teaching experiences accompanied by a seminar. Same as RDG 590.

**EDUC 595. Directed Study Courses in Education****1-3 Credits**

Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall.

**EDUC 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall.

**EDUC 599. Master's Thesis****15 Credits**

Thesis.

**EDUC 600. Doctoral Research****1-15 Credits**

Research.

**EDUC 601. Contemporary Curriculum/Instruction Practices****1-3 Credits**

Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.

**EDUC 602. Internship in Curriculum and Instruction****3-6 Credits**

For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle.

**EDUC 603. Curriculum for a Diverse Society****3 Credits**

Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings.

**EDUC 604. Pedagogy of Learning in a Diverse Society****3 Credits**

Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning.

**EDUC 605. Independent Study Topics****1-3 Credits**

A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes.

**EDUC 606. In-depth Interviewing: A Qualitative Research Method****3 Credits**

Use of pilot research project to introduce students to in-depth interviewing techniques.

**EDUC 607. Current Research in Educational Practice****3 Credits**

A seminar for doctoral and education specialist students emphasizing current research and educational practices. Same as BIL 607, ECED 607, RDG 607, and SPED 607.

**EDUC 608. Issues in Multicultural Curriculum and Instruction and Teacher Education****3 Credits**

Builds upon multicultural theories and practices of teacher education. Restricted to doctoral-level students of any major.

**EDUC 613. Evaluation of Quantitative Research in Education****3 Credits**

A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. May be repeated up to 3 credits.

**EDUC 623. Curricular Mediation for Democratic Communities****3 Credits**

Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BIL 623, ECED 623.

**EDUC 630. Critical Race Theory & Storytelling in Educational Spaces****3 Credits**

An upper-level doctoral course focusing on the philosophical, theoretical, and methodological origins and practices of CRT and the sister frameworks that emerged from CRT, i.e., AsianCrit, BlackCrit, FemCrit, LatCrit, QueerCrit, TribalCrit, and WhiteCrit within educational spaces.

**EDUC 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, ECED 633, EDLT 633, RDG 633.

**EDUC 634. Research as Praxis****3 Credits**

Alternative community-or-school-based research aimed at investigating and transforming educational realities, with the participants for their own benefit. Students will experience the dynamic between research theory and practice in education. Crosslisted with: BIL 634, EDLT 634 and RDG 634. Restricted to: EDUC,C I,C ID majors.

**Prerequisite(s):** EDUC 576 and 613.

**EDUC 635. Critical Theory and Pedagogy****3 Credits**

Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BIL 635.

**EDUC 637. Social Justice Issues in Education****3 Credits**

Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BIL 637.

**EDUC 685. Practicum****2-6 Credits**

Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction.

**Prerequisite:** post-master's standing.

**EDUC 694. Dissertation Seminar: Qualitative Research Designs****1-6 Credits**

Dissertation seminar course for doctoral students utilizing a qualitative research design. Restricted to College of Education students.

**Prerequisite:** consent of instructor.

**EDUC 698. Selected Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 6 credits per semester and a total of 6 credits overall.

**EDUC 699. Ed.S. Thesis****1-15 Credits**

Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle.

**EDUC 700. Doctoral Dissertation****15 Credits**

Dissertation.

## Educational Learning Technology Courses

**EDLT 268. Integrating Technology with Teaching****3 Credits**

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

**EDLT 368. Integrating Technology with Teaching****3 Credits**

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

**Prerequisite:** EDUC 168 or previous computer experience.

**EDLT 520. Critical Digital Literacy****3 Credits**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Pre/

**Prerequisite(s)/Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 522. Technology and Language Learning****3 Credits**

Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. May be repeated up to 3 credits.

**EDLT 528. Foundations of Learning Design & Technology****3 Credits**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Pre/

**Prerequisite(s)/Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 529. Developing and Managing Educational Networks****3 Credits**

For educators who plan to manage technology resources in schools.

Focus on operating systems, network capabilities and management, connections and transfer of files between different computer platforms and managing peripheral devices. Prerequisite(s)/

**Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 560. Fostering Online Learning Communities****3 Credits**

Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.

**EDLT 561. Social Media in Blended and Online Learning Environments****3 Credits**

This course will explore the role of social media in online and blended learning environments through practical hands-on activities, critical dialogue, and collaborative projects which will prepare you to utilize social media personally and pedagogically.

**EDLT 572. Emerging Models for Learning Design and Technology****3 Credits**

Applies instructional strategy development supported by technology for classroom curriculum.

**EDLT 573. Culturally Responsive Teaching with Technology****3 Credits**

Use of inquiry and problem-based learning supported by computer-based applications. Critical analysis of multiple forms of electronic media.

**Prerequisite(s)/Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 574. Technology Planning and Grant Writing****3 Credits**

Application of principles of curriculum development to the integration of technology to improve educational programs. How to develop technology plans, assess current uses of technology, write grants to acquire technology, improve the management of existing and future learning resources, and develop staff development strategies in technology.

**EDLT 575. Designing and Organizing Online Learning Environments****3 Credits**

Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings.

**EDLT 577. Online Teaching and Learning****3 Credits**

This course provides a survey of theories, models and methods used to design and delivery online education through the use of technologies in K-12, higher education, business/industry, and continuing education.

**EDLT 578. Design and Delivery of Webconferences and Webinars****3 Credits**

This course provides hands-on experiences with web conferencing and examines the theory and research of webconferencing's impact on teaching and learning.

**EDLT 579. Universal Design in Online Course Design****3 Credits**

Examines theory, practical application of strategies, and global and policy implications of universal design (UD) in online learning environments.

**EDLT 580. Tools and Techniques for Online Teaching****3 Credits**

Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience.

**EDLT 581. Emerging Technology Tools and Techniques****3 Credits**

This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning.

**EDLT 590. Assessing and Evaluating Online Learning****3 Credits**

Explores a variety of online assessment and evaluation options with an emphasis on continual assessment and evaluation to improve teaching and learning.

**EDLT 592. Directed Studies****3 Credits**

Supervised academic work. Consent of Instructor required.

**EDLT 607. Current Research in Learning and Technology****3 Credits**

Explores models and methods for examining and researching the impact of technology on learning and education.

**EDLT 610. Technology, Society, and Education****3 Credits**

Same as EDUC 610.

**EDLT 612. Advanced Fieldwork****3 Credits**

Fieldwork in learning technologies provides opportunities to integrate theory and practice through research, teaching and/or development.

**EDLT 620. Multimedia, Authoring and Curriculum Design****3 Credits**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Includes additional theoretical research component for doctoral students.

**EDLT 628. Designing Educational Resources for the Internet****3 Credits**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Includes a theoretical and research component for doctoral students.

**EDLT 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, ECED 633, EDUC 633, RDG, 633. Consent of Instructor required.

**EDLT 672. Emerging Models for Learning Design & Technology****3 Credits**

Integration of technology into content areas. May be repeated up to 3 credits.

**EDLT 673. Literacy and Technology****3 Credits**

Same as RDG 673, BIL 673.

**EDLT 677. Online Teaching and Learning****3 Credits**

This course provides a survey of theories; models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. Topics covered include accreditation, assessment, culturally responsive course design, current trends and best practices, hybrid and blended learning, learning management systems, online support services, social justice issues in online education, learner engagement, and retention. Crosslisted with: EDLT 577.

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## Early Childhood - Bachelor of Science in Education

All students wishing to complete a degree in Early Childhood Education (licensure track) must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Undergraduate Resource Center. A 2.5 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass ENGL 111G Rhetoric and Composition, ENGL 211G Writing in the Humanities and Social Sciences, Area II, Prerequisite courses, and Early Childhood Core courses with a grade of C- or better.

**General Education Courses***Area I: English and Communications:*

ENGL 111G	Rhetoric and Composition	4
ENGL 211G	Writing in the Humanities and Social Sciences	3
or ENGL 311G	Advanced Composition	
COMM 253G	Public Speaking	3
or COMM 265G	Principles of Human Communication	

*Area II: Mathematics*

MATH 111	Fundamentals of Elementary Mathematics I	3
MATH 112G	Fundamentals of Elementary Math II	3

*Area III: Laboratory Sciences:*

Two different subjects with labs, must be G courses:		8
ASTR 105G	The Planets	
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
E S 110G	Introductory Environmental Science	
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	

PHYS 110G	The Great Ideas of Physics	
PHYS 120G	Introduction to Acoustics	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	

*Area IV: Social/Behavioral Sciences (9 credits):*

C EP 110G	Human Growth and Behavior	3
Choose two courses from two different departments:		6
ANTH 201G	Introduction to Anthropology	
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
SOC 101G	Introductory Sociology	

*Area V: Humanities and Fine Arts (9 credits):*

Choose one of the following		3
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 111G	Global History to 1500	
or HIST 112G	Global History Since 1500	
Choose one of the following		3
HIST 201G	Introduction to Early American History	
or HIST 202G	Introduction to Recent American History	
Choose one from the following:		3
ART 101G	Orientation in Art	
DANC 101G	Dance Appreciation	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
THTR 101G	The World of Theatre	

**Viewing a Wider World Courses (from two different colleges)** 6**Professional Education Courses***Teacher Education Program Prerequisites*

EDUC 315	Multicultural Education	3
SPED 350	Introduction to Special Education in a Diverse Society	3
EDLT 368	Integrating Technology with Teaching	3
ECED 115	Child Growth, Development, and Learning	3
ECED 125	Health, Safety, and Nutrition	2
ECED 135	Family and Community Collaboration	3
ECED 215	Curriculum Development Through Play	3
ECED 220	Early Childhood Education Practicum I	2
ECED 235	Introduction to Language, Literacy and Reading	3
ECED 255	Assessment of Children and Evaluation of Programs	3
ECED 265	Guiding Young Children	3

*Early Childhood Core Courses*

ECED 225	Curriculum Development and Implementation II	3
ECED 230	Early Childhood Education Practicum II	2
ECED 245	Professionalism	2
ECED 315	Research in Child, Growth, Development and Learning	3
ECED 335	Family, Language and Cultural	3
ECED 440	Teaching and Learning Math and Science	4
ECED 455	Teaching and Learning Social Studies, Fine Arts and Movement	3
RDG 350	Teaching and Learning Reading and Writing	3
SPED 450	Working with Young Children with Special Needs, Ages 3-8	3
SPED 451	Assessment of Young Children, Birth- Eight	3
ECED 329	Early Primary Field Placement	2
ECED 470	Student Teaching/Seminar	6
SPED 483	Early Childhood SPED Student Teaching	6

Total Credits	122
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## Elementary Education - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Education. The B.S. Elementary Education degree embeds the Language Arts Teaching Field/Concentration and the Bilingual/TESOL endorsements. **Note: For certification in the State of New Mexico the Bilingual/TESOL endorsements require 6 credits of a language other than English.** Additional teaching fields/concentrations are available in Social Studies, Science and Math but will require credits beyond 120. Students should meet with the College of Education (Undergraduate Resource Center) to discuss additional teaching fields/concentrations requirements.

**General Education Courses**

<i>Area I: English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition	4
ENGL 211G	Writing in the Humanities and Social Sciences	3
or ENGL 311G	Advanced Composition	
ENGL 363	Literature for Children and Young Adults	3
COMM 253G	Public Speaking	3
or COMM 265G	Principles of Human Communication	
<i>Area II: Mathematics</i>		
MATH 111	Fundamentals of Elementary Mathematics I	3
MATH 112G	Fundamentals of Elementary Math II	3
<i>Area III: Laboratory Science</i>		
Choose two from the following from two different subject areas:		8
ASTR 105G	The Planets	
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	

BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
E S 110G	Introductory Environmental Science	
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	
PHYS 110G	The Great Ideas of Physics	
PHYS 120G	Introduction to Acoustics	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
<i>Area IV: Social Behavioral Sciences</i>		
C EP 110G	Human Growth and Behavior	3
LING 200G	Introduction to Language	3
Choose one from the following:		3
GEOG 112G	World Regional Geography	
or GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
or GOVT 110G	Introduction to Political Science	
<i>Area V: Humanities and Fine Arts</i>		
HIST 111G	Global History to 1500	3
or HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
Choose one from the following:		3
ART 101G	Orientation in Art	
DANC 101G	Dance Appreciation	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
THTR 101G	The World of Theatre	
<i>Viewing a Wider World Courses from two different colleges</i>		6
<b>Education Prerequisite Courses</b>		
EDUC 103	Introduction with Internship in Bilingual Education/ESL	3
EDUC 204	Foundations of Bilingual/ESL Education	3
C EP 210	Educational Psychology	3
EDUC 315	Multicultural Education	3
SPED 350	Introduction to Special Education in a Diverse Society	3
EDLT 368	Integrating Technology with Teaching	3
<b>Education Core Courses</b>		
EDUC 343	Language, Literacy, and Culture in the ESL Classrooms	3
EDUC 451	Methods of Teaching Elementary School Science	3

EDUC 342	Sheltered English Instruction for the ESL Classroom	3
EDUC 452	Methods of Teaching Elementary School Mathematics	3
EDUC 454	Methods of Teaching Elementary School Social Studies	3
EDUC 483	Second Language Acquisition	3
RDG 360	Elementary School Literacy I	3
RDG 361	Elementary School Literacy II	3
RDG 371	Instruction for Special Reading Needs	3
SPED 360	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
EDUC 470	Elementary Student Teaching	9
EDUC 481	Elementary Student Teaching Seminar	3
<i>Remaining BIL/TESOL Courses</i>		
EDUC 344	Issues in Schooling for Bilingual Learners	3
SPED 355	Introduction to Bilingual/Multicultural Special Education	3
LING 302V	Language and Society	3
<b>Concentrations: (Language Arts embedded in degree plan)</b>		
Total Credits		120

## Concentration: Language Arts K-8

Courses listed below are required for the teaching field/concentration as per State of New Mexico requirements. Note: All courses are included in the Elementary Education degree plan and does not require additional credits/courses.

COMM 253G	Public Speaking	3
or COMM 265G	Principles of Human Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	3
or ENGL 311G	Advanced Composition	
ENGL 363	Literature for Children and Young Adults	3
LING 200G	Introduction to Language	3
LING 302V	Language and Society	3
RDG 360	Elementary School Literacy I	3
RDG 361	Elementary School Literacy II	3
RDG 371	Instruction for Special Reading Needs	3
Total Credits		24

## Concentration: Math K-8

Students with consent of an advisor and the mathematics department may take higher level math classes. Courses listed below are required for the teaching field/concentration as per State of New Mexico requirements. Note: Some courses are included in the Elementary Education degree plan and will require additional credits/courses.

### Core Courses

MATH 111	Fundamentals of Elementary Mathematics I	3
MATH 112G	Fundamentals of Elementary Math II	3
MATH 215	Fundamentals of Elementary Mathematics III	3

MATH 120	Intermediate Algebra	3
MATH 121G	College Algebra	3
MATH 142G	Calculus for the Biological and Management Sciences	3
STAT 251G	Statistics for Business and the Behavioral Sciences	3
EDUC 452	Methods of Teaching Elementary School Mathematics	3
Total Credits		24

## Concentration: Science K-8

Courses listed below are required for the teaching field/concentration as per State of New Mexico requirements. Note: Some courses are included in the Elementary Education degree plan and will require additional credits/courses.

SCIENCE from the general education requirements on degree plan	8	
ASTR elective	3	
BIOL elective	3	
CHEM elective	3	
GEOL or Physical GEOG elective	3	
SCIENCE elective	4	
Total Credits		24

## Concentration: Social Studies K-8

Courses listed below are required for the teaching field/concentration as per State of New Mexico requirements. Note: Some courses are included in the Elementary Education degree plan and will require additional credits/courses.

ANTH elective	3	
ECON elective	3	
GEOG or GOVT elective	3	
HIST 111G	Global History to 1500	3
HIST 112G	Global History Since 1500	3
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
HIST 368	Teaching History	3
HIST elective	3	
Total Credits		24

## Elementary Education Endorsement Areas (24 credits)

Elementary Education majors are required to complete a teaching field (endorsement area) in an academic discipline. A list of teaching fields is available in the College of Education Undergraduate Resource Center and Center for Academic Advising and Student Support (CAASS).

## Bilingual/TESOL Endorsement

Early Childhood, Secondary and Special Education students interested in a bilingual or TESOL endorsement should contact the College of Education Undergraduate Resource Center. These endorsements can now be included in an undergraduate degree program without significant additional credits/courses required.

## Secondary Education - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Education. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The below programs are labeled as Concentrations in the catalog and on student transcripts, but are also recognized at "Teaching Fields" for the Teacher Education Program.

## Concentration: Secondary Education Language Arts

### General Education

#### Area I: English and Communication <sup>1</sup>

ENGL 111G	Rhetoric and Composition	4
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#### Area II: Mathematics

MATH 121G	College Algebra	3
or MATH 190G	Trigonometry and Precalculus	
MATH 210G	Mathematics Appreciation	3
or MATH 142G	Calculus for the Biological and Management Sciences	

#### Area III: Laboratory Sciences

Choose two different subject areas	8
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ASTR 105G	The Planets	
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
GEOG 111G	Introductory Geology	
GEOG 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	

#### Area IV: Social and Behavioral Sciences

C EP 110G	Human Growth and Behavior	3
JOUR 105G	Media and Society	3

Choose one from the following:	3
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ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	

GOVT 160G	International Political Issues	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
<b>Area V: Humanities and Fine Arts</b>		
HIST 101G	Roots of Modern Europe	3
or HIST 102G	Modern Europe	
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
THTR 101G	The World of Theatre	3
<b>Viewing a Wider World (3 credits satisfied with content area courses)</b>		
LIB 311V	Information Literacy	3
<b>Education Core Courses</b>		
EDUC 281	Introduction to Secondary Education and Youth	3
EDUC 315	Multicultural Education	3
SPED 350	Introduction to Special Education in a Diverse Society	3
EDLT 368	Integrating Technology with Teaching	3
EDUC 381	Secondary Field Experience	3
EDUC 342	Sheltered English Instruction for the ESL Classroom	3
EDUC 495	Directed Study Courses in Education (Data Literacy and Assessment)	3
EDUC 475	Contemporary Issues in Education	3
EDUC 460	Teaching Language Arts at the Middle and High School Level	3
RDG 414	Content Area Literacy	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
EDUC 471	Secondary Student Teaching	9
EDUC 482	Middle and High School Student Teaching Seminar	3
<b>Language Arts Content Area</b>		
COMM 253G	Public Speaking	3
or COMM 265G	Principles of Human Communication	
ENGL 311G	Advanced Composition	3
or ENGL 318G	Advanced Technical and Professional Communication	
ENGL 251	Survey of American Literature I	3
or ENGL 252	Survey of American Literature II	
ENGL 271	Survey of English Literature I	3
or ENGL 272	Survey of English Literature II	
ENGL 310	Critical Writing	3
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 341V	American Indian Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Choose one from the following:		3
ENGL 405	Chaucer	
ENGL 429	British Romanticism	
ENGL 438	Literature of the American Renaissance	

ENGL 442	Modern and Contemporary American Poetry	
ENGL 444	Modern British Fiction	
ENGL 458	Latino/a Literature and Culture	
ENGL 463	Advanced Study in English Literature	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 493	Middle English Textual Cultures	
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
Select one from the following:		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
ENGL 416	Approaches to Literature	3
ENGL 470	Approaches to Composition	3
ENGL Elective 400+		3
Total Credits		120

<sup>1</sup> Other requirements are met by finishing the Language Arts Teaching Field.

## Concentration: Secondary Education Math

### General Education

<b>Area I: English and Communication</b>		
ENGL 111G	Rhetoric and Composition	4
Choose one from the following:		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<b>Area II: Mathematics (completed with the Math Concentration)</b>		
<b>Area III: Laboratory Sciences</b>		
Choose one from the following:		4
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory	
Choose one from the following:		4
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	
<b>Area IV: Social and Behavioral Sciences</b>		
C EP 110G	Human Growth and Behavior	3
Choose one of the following courses:		3
ECON 201G	Introduction to Economics	

ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
Choose one from the following:		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
GOVT 160G	International Political Issues	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	

*Area V: Humanities and Fine Arts*

HIST 101G	Roots of Modern Europe	3
or HIST 102G	Modern Europe	
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
Choose one from the following:		3
ART 101G	Orientation in Art	
DANC 101G	Dance Appreciation	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
THTR 101G	The World of Theatre	

**Viewing a Wider World (3 credits satisfied with content area courses)**

LIB 311V	Information Literacy	3
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**Education Core Courses**

EDUC 281	Introduction to Secondary Education and Youth	3
EDUC 315	Multicultural Education	3
SPED 350	Introduction to Special Education in a Diverse Society	3
EDLT 368	Integrating Technology with Teaching	3
EDUC 381	Secondary Field Experience	3
EDUC 342	Sheltered English Instruction for the ESL Classroom	3
EDUC 495	Directed Study Courses in Education (Data Literacy and Assessment)	3
EDUC 475	Contemporary Issues in Education	3
EDUC 462	Teaching Mathematics at the Middle and High School Level	3
RDG 414	Content Area Literacy	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
EDUC 471	Secondary Student Teaching	9
EDUC 482	Middle and High School Student Teaching Seminar	3

**Math Content Area Courses**

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
C S 111	Computer Science Principles	4
E T 182	Digital Logic	3
MATH 279	Introduction to Higher Mathematics	3
MATH 280	Introduction to Linear Algebra	3
STAT 371	Statistics for Engineers and Scientists I	3
or A ST 311	Statistical Applications	
Math elective 300+ or A ST 311		3
Math elective 300+		3
Math elective 300+		3
Total Credits		120

**Concentration: Secondary Education  
General Science****General Education***Area I: English and Communication*

ENGL 111G	Rhetoric and Composition	4
Choose one from the following:		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	

*Area II: Mathematics*

MATH 121G	College Algebra	3
or MATH 190G	Trigonometry and Precalculus	
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 191G	Calculus and Analytic Geometry I	

*Area III: Laboratory Sciences (completed with the Science Concentration)**Area IV: Social and Behavioral Sciences*

C EP 110G	Human Growth and Behavior	3
GEOG 112G	World Regional Geography	3
or GEOG 120G	Culture and Environment	
Choose one from the following:		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	

*Area V: Humanities and Fine Arts*

Choose one from the following	3
HIST 101G Roots of Modern Europe	
HIST 102G Modern Europe	
HIST 110G Making History	
HIST 111G Global History to 1500	
HIST 112G Global History Since 1500	
HIST 201G Introduction to Early American History	
HIST 202G Introduction to Recent American History	
HIST 211G East Asia to 1600	
HIST 212G East Asia since 1600	
HIST 221G Islamic Civilizations to 1800	
HIST 222G Islamic Civilizations since 1800	
Choose two "G" courses in different departments (ART, DANC, ENGL, HIST, MUS, PHIL, THTR)	6
<b>Viewing a Wider World (3 additional credits satisfied with content area courses)</b>	
LIB 311V Information Literacy	3
<b>Education Core Courses</b>	
EDUC 281 Introduction to Secondary Education and Youth	3
EDUC 315 Multicultural Education	3
SPED 350 Introduction to Special Education in a Diverse Society	3
EDLT 368 Integrating Technology with Teaching	3
EDUC 381 Secondary Field Experience	3
EDUC 342 Sheltered English Instruction for the ESL Classroom	3
EDUC 495 Directed Study Courses in Education (Data Literacy and Assessment)	3
EDUC 489 Topics (Science for Educators)	3
EDUC 475 Contemporary Issues in Education	3
EDUC 463 Teaching Science at the Middle and High School Level	3
RDG 414 Content Area Literacy	3
SPED 480 Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
EDUC 471 Secondary Student Teaching	9
EDUC 482 Middle and High School Student Teaching Seminar	3
<b>General Science Core Courses</b>	
BIOL 111G Natural History of Life	3
BIOL 111GL Natural History of Life Laboratory	1
BIOL 211G Cellular and Organismal Biology	3
BIOL 211GL Cellular and Organismal Biology Laboratory	1
CHEM 111G General Chemistry I	4
or CHEM 115 Principles of Chemistry I	
CHEM 112G General Chemistry II	4
or CHEM 116 Principles of Chemistry II	
Choose one from the following:	4
PHYS 211G & 211GL General Physics I and General Physics I Laboratory	

PHYS 213 & 213 L Mechanics and Experimental Mechanics	
PHYS 215G & 215GL Engineering Physics I and Engineering Physics I Laboratory	
PHYS 221G & 221GL General Physics for Life Sciences I and Laboratory to General Physics for Life Science I	
Choose one from the following:	4
PHYS 212G & 212GL General Physics II and General Physics II Laboratory <sup>1</sup>	
PHYS 214 & 214 L Electricity and Magnetism and Electricity and Magnetism Laboratory	
PHYS 216G & 216GL Engineering Physics II and Engineering Physics II Laboratory	
PHYS 222G & 222GL General Physics for Life Sciences II and Laboratory to General Physics for Life Sciences II	
BIOL 301 Principles of Ecology	3
BIOL 305 Principles of Genetics	3
BIOL 467 Evolution	3
BIOL 300+ Plant Science Elective	3
Total Credits	121

## Concentration: Secondary Education Social Studies

### General Education

<i>Area I: English and Communication</i>	
ENGL 111G Rhetoric and Composition	4
Choose one from the following:	3
ENGL 211G Writing in the Humanities and Social Sciences	
ENGL 311G Advanced Composition	
ENGL 318G Advanced Technical and Professional Communication	
Choose one from the following:	3
COMM 253G Public Speaking	
COMM 265G Principles of Human Communication	
AXED 201G Effective Leadership and Communication in Agricultural Organizations	
<i>Area II: Mathematics</i>	
MATH 121G College Algebra	3
or MATH 190G Trigonometry and Precalculus	
MATH 210G Mathematics Appreciation	3
or MATH 142G Calculus for the Biological and Management Sciences	
<i>Area III: Laboratory Sciences:</i>	
Choose two from two different subject areas	8
ASTR 105G The Planets	
or ASTR 110G Introduction to Astronomy	
BIOL 101G & 101GL Human Biology and Human Biology Laboratory	
BIOL 110G Contemporary Problems in Biology	

BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	
<i>Area IV: Social and Behavioral Sciences:</i>		
C EP 110G	Human Growth and Behavior	3
GEOG 120G	Culture and Environment	3
GOVT 100G or GOVT 110G	American National Government or Introduction to Political Science	3
<i>Area V: Humanities and Fine Arts:</i>		
HIST 111G or HIST 112G	Global History to 1500 or Global History Since 1500	3
HIST 211G or HIST 212G	East Asia to 1600 or East Asia since 1600	3
HIST 221G or HIST 222G	Islamic Civilizations to 1800 or Islamic Civilizations since 1800	3
<b>Viewing a Wider World (3 additional credits satisfied with content area courses)</b>		
LIB 311V	Information Literacy	3
<b>Education Core Courses</b>		
EDUC 281	Introduction to Secondary Education and Youth	3
EDUC 315	Multicultural Education	3
SPED 350	Introduction to Special Education in a Diverse Society	3
EDLT 368	Integrating Technology with Teaching	3
EDUC 381	Secondary Field Experience	3
EDUC 342	Sheltered English Instruction for the ESL Classroom	3
EDUC 495	Directed Study Courses in Education (Data Literacy and Assessment)	3
EDUC 475	Contemporary Issues in Education	3
EDUC 461	Teaching Social Studies at the Middle and High School Level	3
RDG 414	Content Area Literacy	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
EDUC 471	Secondary Student Teaching	9
EDUC 482	Middle and High School Student Teaching Seminar	3
<b>Social Studies Core Courses</b>		
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
GEOG 281	Map Use: Reading, Analysis and Interpretation	3
HIST 101G	Roots of Modern Europe	3

or HIST 102G	Modern Europe	
HIST 201G	Introduction to Early American History	3
HIST 202G	Introduction to Recent American History	3
HIST 368	Teaching History	3
HIST 386	New Mexico History	3
GOVT, ECON, GEOG, or HIST Elective 300+		3
HIST Elective 300+		3
<b>Total Credits</b>		<b>120</b>

## Zero-to-Four (Early Childhood) - Bachelor of Applied Studies

There is an identified need for prepared educators to serve young children ages zero to four years old in settings outside of the public school in childcare centers, Head Start, and other agencies. The Curriculum and Instruction Department offers a non-licensure concentration, with the Bachelor of Applied Studies degree for the Zero to Four years old early childhood track. This non-licensure concentration serves private and public childcare, early intervention programs, and Head Start.

### General Education Requirements

#### Area I: English and Communication

ENGL 111G	Rhetoric and Composition	4
ENGL 211G	Writing in the Humanities and Social Sciences	3
or ENGL 311G	Advanced Composition	
COMM 253G	Public Speaking	3
or COMM 265G	Principles of Human Communication	

#### Area II: Mathematics

MATH 111	Fundamentals of Elementary Mathematics I ((MATH 120 is prerequisite))	3
MATH 112G	Fundamentals of Elementary Math II	3

#### Area III: Laboratory Sciences

<b>Choose two different areas with labs</b>		<b>8</b>
ASTR 105G	The Planets	
ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
E S 110G	Introductory Environmental Science	
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	
PHYS 110G	The Great Ideas of Physics	
PHYS 120G	Introduction to Acoustics	

PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
<b>Area IV: Social/Behavioral Sciences</b>		
C EP 110G	Human Growth and Behavior	3
Choose two from the following courses <sup>1</sup>		6
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
PSY 201G	Introduction to Psychology	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
W S 201G	Introduction to Women s Studies	
W S 202G	Representing Women Across Cultures	
<b>Area V: Humanities and Fine Arts <sup>1</sup></b>		
Choose two of the following		6
ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
DANC 101G	Dance Appreciation	
ENGL 115G	Perspectives on Literature	
ENGL 116G	Perspectives on Film	
ENGL 220G	Introduction to Creative Writing	
ENGL 244G	Literature and Culture	
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 110G	Making History	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	
HIST 222G	Islamic Civilizations since 1800	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
PHIL 100G	Philosophy, Law and Ethics	
PHIL 101G	The Art of Wondering	
PHIL 124G	Philosophy of Music	
PHIL 136G	The Quest for God	
PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	
<b>Viewing a Wider World Courses</b>		
CAST 301V	Introduction to Child Advocacy	3

Choose one from the following:		3
ANTH 305V	Contemporary Native Americans	
or ANTH 360V Food and Culture Around the World		
C EP 300V	Human Relations Training	
C EP 451V	Introduction to Counseling	
ENGL 341V	American Indian Literature	
ENGL 394V	Southwestern Literature	
PSY 417V	Intercultural Relations	
SOC 374V	Comparative Family Systems	

**College of Education Requirements:**

ECED 115	Child Growth, Development, and Learning	3
ECED 125	Health, Safety, and Nutrition	2
ECED 135	Family and Community Collaboration <sup>2</sup>	3
ECED 235	Introduction to Language, Literacy and Reading <sup>2</sup>	3
ECED 255	Assessment of Children and Evaluation of Programs <sup>2</sup>	3
ECED 265	Guiding Young Children	3
EDUC 315	Multicultural Education	3
SPED 350	Introduction to Special Education in a Diverse Society	3

*Language Requirement (prefer Spanish or Sign-Language)* 6-8

**ECED Courses for Major:**

ECED 215	Curriculum Development Through Play	3
ECED 220	Early Childhood Education Practicum I	2
ECED 225	Curriculum Development and Implementation II	3
ECED 230	Early Childhood Education Practicum II	2
ECED 245	Professionalism	2
ECED 315	Research in Child, Growth, Development and Learning	3
ECED 335	Family, Language and Cultural	3
ECED 351	Emergent Literacy	3
ECED 420	Integrated Early Childhood Curriculum	4
ECED 425	Integrated Curriculum Practicum	2
SPED 450	Working with Young Children with Special Needs, Ages 3-8	3
SPED 451	Assessment of Young Children, Birth-Eight	3
ECED 465	Advanced Caregiving for Infants and Toddlers	3

**Departmental Electives:**

10-12 electives credits for a total of 120 credits, 6 of which must be upper-division 10-12

Total Credits 120-124

## Early Childhood Education - Undergraduate Minor

The primary function of the undergraduate programs in the Department of Curriculum and Instruction is the preparation of licensed teachers for early-childhood settings and elementary and secondary schools. This process includes a broad general education, professional education and teaching specializations.

**Early Childhood Education Minor**

<i>Select a minimum of 9 credits in lower division courses</i>		<b>9</b>
ECED 115	Child Growth, Development, and Learning	
ECED 125	Health, Safety, and Nutrition	
ECED 135	Family and Community Collaboration	
ECED 235	Introduction to Language, Literacy and Reading	
ECED 245	Professionalism	
ECED 255	Assessment of Children and Evaluation of Programs	
ECED 265	Guiding Young Children	
FCS 210	Infancy and Early Childhood in the Family	
C EP 215	The Preschool Child	
<i>Select a minimum of 9 credits in upper division courses</i>		<b>9</b>
ECED 315	Research in Child, Growth, Development and Learning	
ECED 335	Family, Language and Cultural	
ECED 351	Emergent Literacy	
ECED 465	Advanced Caregiving for Infants and Toddlers	
SPED 350	Introduction to Special Education in a Diverse Society	
SPED 450	Working with Young Children with Special Needs, Ages 3-8	
EDUC 315	Multicultural Education	
FCS 383	Parenting and Child Guidance	
CAST 301V	Introduction to Child Advocacy	
SOC 390	Sociology of Childhood	
<b>Total Credits</b>		<b>18</b>

## Education - Master of Arts

The Department of Curriculum & Instruction in the College of Education is devoted to the preparation of teachers and teacher leaders for the public schools; directors of curriculum and instruction; subject matter specialists; teacher educators and professional development specialists; and, college professors and professors of curriculum and instruction. The College of Education has NCATE (National Council for Accreditation of Teacher Education, application to Council for the Accreditation of Educator Preparation under review) and New Mexico Public Education Department accreditation.

**Remember** You cannot teach in the public schools without seeking a teaching license and you cannot seek an endorsement without first obtaining an initial teaching license.

**Master of Arts in Education (for licensed PK-12 teachers)** Minimum credits differ between program concentrations. Please consult the program handbook or the department for specifics.

**Degree Concentration Areas**

- Curriculum & Instruction
- Bilingual Education
- Educational Learning Technologies
- Language, Literacy & Culture (Reading)
- Teaching English to Speakers of Other Languages (TESOL)

- Early Childhood Education (on-line only)

**The Master of Arts Degree Core Courses** – 15 (credit hours)

The faculty members in the Department of Curriculum & Instruction have developed these core courses to provide a strong foundation in teaching and learning for all Master's candidates pursuing the MA degree. The core courses are as follows:

<b>Curriculum and Instruction Core</b>		
EDUC 515	Multicultural Education	<b>3</b>
EDUC 516	Curriculum and Pedagogy I	<b>3</b>
EDUC 518	Technology and Pedagogy	<b>3</b>
EDUC 519	Research in Curriculum and Pedagogy	<b>3</b>
EDUC 520	Action Research Projects <sup>1</sup>	<b>3</b>
<b>Total Credits</b>		<b>15</b>

Additional coursework for the concentration area will be needed to obtain sufficient credits for completion of the MA degree (15-21 hours)

<sup>1</sup> This course is the final core course that students are required to take. EDUC 515, 516, 518 and 519 are prerequisites to taking EDUC 520.

(Please see the Graduate Catalog for complete course descriptions: <http://catalog.nmsu.edu/>)

**Optional Endorsements for existing teaching licenses:**

- Bilingual
- Technology Coordinator
- Reading
- Teaching English to Speakers of Other Languages (TESOL)

**Master of Arts in Education (Non-License)**

Students can select a Master of Arts in Education (non-license) in one of the following concentration areas:

- Curriculum & Instruction
- Bilingual Education
- Educational Learning Technologies
- Early Childhood Education;
- Language, Literacy & Culture (Reading); or,
- Teaching English to Speakers of Other Languages (TESOL).

Students completing the above programs will not be licensed to teach PreK-12 in the State of New Mexico, nor will completion of these degree programs automatically result in a teaching field endorsement. The credits may apply toward an endorsement depending on New Mexico Public Education guidelines.

**Master of Arts in Education Plus License Concurrently** – Students can earn a teaching license in the areas of elementary education and secondary education while earning a Master of Arts in Education degree

**Checklist Completing the Master of Arts Program**

1. **Apply** through NMSU Graduate School main webpage (<https://gradschool.nmsu.edu/>). Select Intended major "Education" and the concentration you will pursue;
2. **After** you receive an acceptance letter from the Department of Curriculum & Instruction, contact your faculty advisor within the first semester of enrollment (a listing of the C&I faculty and their

contact information can be located on the C&I Website: <http://education.nmsu.edu/ci/faculty.html>);

3. \_\_\_ **Join the C&I MA Student List-serv** at the following website, and follow the directions: <https://mailman.nmsu.edu/mailman/listinfo/candima>. It is important to regularly check your NMSU e-mail; the university sends important communications to you through that account. Also check the Department of Curriculum & Instruction Masters Website for important announcements and activities;
4. \_\_\_ **Contact** your advisor to complete a Preliminary Program Plan;
5. \_\_\_ **Complete the Program of Study and a STAR audit** (After you have completed 12 credit hours) and make an appointment with your advisor to approve and sign the form. It must be filed with the Department of Curriculum & Instruction. Find the form at: <http://prospective.nmsu.edu/graduate/forms/index.html>
6. \_\_\_ **File the Application for Degree form** during the registration period of your final semester (<http://www.nmsu.edu/~registra/degree-app/>);
7. \_\_\_ **Apply** to take the written Master's Comprehensive Examination early in the last semester of your coursework. The MA exam usually occurs on the second Friday of October and the second Friday of March. Announcements regarding registration, the preparation session, and the exam will be on the C&I MA Website, the MA list-serv, and in the College of Education;
8. \_\_\_ **Complete** the Final Examination paperwork; and,
9. \_\_\_ **Study** for the Final Written Examination to be successful on your exam.

Complete Department of Curriculum and Instruction Information is located at: <http://ci.nmsu.edu> (<https://ci.nmsu.edu>)

Complete NMSU Graduate School Information is available on-line (<http://gradschool.nmsu.edu>)

## Education - Master of Arts in Teaching

### Master of Arts in Teaching (MAT)

- This is a non-licensure degree that is intended for working teachers who already have a license but want to continue their studies, specialize in a specific teaching field and earn a master's degree. The program requires a minimum of 33 credit hours, with 15 credits in the Department of Curriculum & Instruction core courses and 18 credit hours from an area of teaching content specialization (i.e., generally in the College of Arts & Sciences) numbered 450 or above. The professional coursework must be taken in the Department of Curriculum & Instruction and culminates with a written examination over the program of study. A candidate may choose to write a thesis in place of the written exam. Please check with your faculty advisor or the Director for Graduate Programs for additional information.

#### C&I Core Courses

EDUC 515	Multicultural Education	3
EDUC 516	Curriculum and Pedagogy I	3
EDUC 518	Technology and Pedagogy	3
EDUC 519	Research in Curriculum and Pedagogy	3
EDUC 520	Action Research Projects <sup>1</sup>	3

<sup>1</sup> This course is the final core course that students are required to take. EDUC 515, 516, 518 and 519 are prerequisites to taking EDUC 520.

### Current MAT Programs

The Department of Curriculum & Instruction currently offers the following customized MAT Programs in collaboration with colleagues from other departments.

- Master of Arts in Teaching, with a concentration in Dance (33 credits)
  - For more information, go to <http://kind.nmsu.edu/dance-main/academic-dance/masters-of-arts-in-teaching-concentration-in-dance/>
- Master of Arts in Teaching, with a concentration in Spanish (33 credits)
  - For more information, go to [https://ci.nmsu.edu/programs/ci\\_distance\\_ed/mats/](https://ci.nmsu.edu/programs/ci_distance_ed/mats/)

For additional information about the MAT, please contact the Departmental office (575-646-4820) or [currandinstr@nmsu.edu](mailto:currandinstr@nmsu.edu)

## Curriculum and Instruction - Doctor of Education

The Curriculum and Instruction Department offers two kinds of doctorates: The Doctorate of Education and the Doctorate of Philosophy.

The Doctorate of Education (EdD) and the Doctorate of Philosophy (PhD) are rigorous degrees requiring an intellectual and personal commitment. Both degrees ask for a lifelong commitment to teaching, learning and pedagogy, as well as, to research and service. The academic course of study for both degrees is the same. The EdD doctoral program of study requires a minimum of 66 credit hours (48 hours coursework and 18 hours of dissertation) to complete. The PhD doctoral program requires students to demonstrate competency in the computer tools or second language sequence. (See below in program descriptions). For both programs (EdD and PhD) 66 credit hours is only the minimum and students may be asked to complete additional hours as per their advisor and committee recommendations.

Both degrees require a dissertation based on original research, inextricably grounded with an array of primary and secondary sources. Both degrees have required courses of study, but are additionally individualized based on those scholarly and academic expectations set by the doctoral student in collaboration with their Dissertation Committee.

## Options and Concentration

Currently there are four Options and one concentration for the Doctoral Program of the Department of Curriculum & Instruction. These are:

### Options:

1. Bilingual/TESOL
2. Critical Pedagogies
3. Early Childhood Education
4. Language, Literacy & Culture

### Concentration:

1. Educational Learning Technologies

## To Apply

- Apply to the NMSU Graduate School (<http://gradadmissions.nmsu.edu>) (Select Intended major "Curriculum and Instruction" and then concentration you will pursue);
- Apply to C&I by submitting your Application Portfolio by December 15th (via the Graduate School Application portal)
  - See the sections, "Applying to the Doctoral Program," "Doctoral Intake Application Instructions" and the "C&I Doctoral Student Checklist" in the Doctoral Handbook (<http://dept-wp.nmsu.edu/coeci/candi-handbooks>).
- NMSU Doc Portfolio Example – C&I (<http://ci.education.nmsu.edu/files/2013/12/NMSU-Doc-Portfolio-Example-CI.pdf>) (If the Sample portfolio does not open automatically, try a different browser or try saving the portfolio to your desktop before opening it.)

NOTE: Potential students who have written successful portfolios will be invited to interview with the Doctoral Qualifying Committee (a committee of C&I faculty)

### Once Applicants Are Accepted

- Attend the applicable Doctoral Orientation Meeting your first semester of classes
- Meet with your Interim Advisor during your first semester of classes
- Get to know our faculty (<http://dept-wp.nmsu.edu/coeci/faculty>)
- Read the Doctoral Handbook (<http://dept-wp.nmsu.edu/coeci/candi-handbooks>) and the sections of the NMSU Graduate Catalog that apply to you (this is your responsibility)
- Follow the Doctoral Program Checklist from the C&I Doctoral Handbook (<http://dept-wp.nmsu.edu/coeci/candi-handbooks>)

## Curriculum and Instruction - Doctor of Philosophy

The Curriculum and Instruction Department offers two kinds of doctorates: The Doctorate of Education and the Doctorate of Philosophy.

The Doctorate of Education (EdD) and the Doctorate of Philosophy (PhD) are rigorous degrees requiring an intellectual and personal commitment. Both degrees ask for a lifelong commitment to teaching, learning and pedagogy, as well as, to research and service. The academic course of study for both degrees is the same. The EdD doctoral program of study requires a minimum of 66 credit hours (48 hours coursework and 18 hours of dissertation) to complete. The PhD doctoral program requires students to demonstrate competency in the computer tools or second language sequence. (See below in program descriptions). For both programs (EdD and PhD) 66 credit hours is only the minimum and students may be asked to complete additional hours as per their advisor and committee recommendations.

Both degrees require a dissertation based on original research, inextricably grounded with an array of primary and secondary sources. Both degrees have required courses of study, but are additionally individualized based on those scholarly and academic expectations set by the doctoral student in collaboration with their Dissertation Committee.

## Options and Concentration

Currently there are four Options and one concentration for the Doctoral Program of the Department of Curriculum & Instruction. These are:

### Options:

1. Bilingual/TESOL
2. Critical Pedagogies
3. Early Childhood Education
4. Language, Literacy & Culture

### Concentration:

1. Educational Learning Technologies

## To Apply

- Apply to the NMSU Graduate School (<http://gradadmissions.nmsu.edu>) (Select Intended major "Curriculum and Instruction" and then concentration you will pursue);
- Apply to C&I by submitting your Application Portfolio by December 15th (via the Graduate School Application portal)
  - See the sections, "Applying to the Doctoral Program," "Doctoral Intake Application Instructions" and the "C&I Doctoral Student Checklist" in the Doctoral Handbook (<http://dept-wp.nmsu.edu/coeci/candi-handbooks>).
  - NMSU Doc Portfolio Example – C&I (<http://ci.education.nmsu.edu/files/2013/12/NMSU-Doc-Portfolio-Example-CI.pdf>) (If the Sample portfolio does not open automatically, try a different browser or try saving the portfolio to your desktop before opening it.)

NOTE: Potential students who have written successful portfolios will be invited to interview with the Doctoral Qualifying Committee (a committee of C&I faculty)

### Once Applicants Are Accepted

- Attend the applicable Doctoral Orientation Meeting your first semester of classes
- Meet with your Interim Advisor during your first semester of classes
- Get to know our faculty (<http://dept-wp.nmsu.edu/coeci/faculty>)
- Read the Doctoral Handbook (<http://dept-wp.nmsu.edu/coeci/candi-handbooks>) and the sections of the NMSU Graduate Catalog that apply to you (this is your responsibility)
- Follow the Doctoral Program Checklist from the C&I Doctoral Handbook (<http://dept-wp.nmsu.edu/coeci/candi-handbooks>)

## Online Teaching & Learning Technologies - Graduate Certificate

The Online Teaching and Learning Graduate Certificate (OTLGC) is for professionals in business, government, education, or other settings who want to develop their knowledge and skills in online teaching and learning.

OTL utilizes technology-based environments to actively engage students in designing formal educational projects that meet professional objectives. The five core courses (3-credits each) are sequences to provide an intense immersion in a dynamic online environment and culminates in an online teaching practicum.

Prime candidates for the OTLGC program are individuals with a need to explore online teaching and learning techniques and the willingness to engage in collaborative learning projects.

OTL courses can be taken as electives by students who do not wish to complete the certificate program.

Current NMSU graduate students can take the OTLGC program. However, the decision about if and how OTL courses factor into a degree plan, or not, is decided by the department issuing the graduate degree. It's highly recommended you meet with your graduate advisor before you start the OTLGC program. You will either have to complete the OTLGC before or during the same semester you complete your graduate degree. If you start the OTLGC during your graduate degree program you cannot complete the OTLGC after completing your graduate degree. If you start the OTLGC program after completing your graduate degree, there isn't a conflict.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
EDLT 560	Fostering Online Learning Communities	3
EDLT 575	Designing and Organizing Online Learning Environments	3
Credits		6
<b>Spring</b>		
EDLT 580	Tools and Techniques for Online Teaching	3
EDLT 590	Assessing and Evaluating Online Learning	3
Credits		6
<b>Summer</b>		
EDLT 592	Directed Studies	3
Credits		3
Total Credits		15

Other courses that are available are EDLT 561 Social Media in Blended and Online Learning Environments (for Fall), EDLT 579 Universal Design in Online Course Design or EDLT 581 Emerging Technology Tools and Techniques (for Spring), EDLT 578 Design and Delivery of Webconferences and Webinars (for Summer).

## Educational Leadership and Administration

### Undergraduate Program Information

The mission of the Department of Educational Leadership and Administration at New Mexico State University is to prepare and graduate capable, skillful and dynamic educational leaders for a diverse society. Through use of theory and practice we aim to develop change agents and role models for socially-just educational systems.

#### Educational Leadership and Administration (ELA)

At the undergraduate level, ELA offers the following courses:

ELA 215	Multicultural Leadership in Education	3
ELA 255	Leadership and Change in Education	3
ELA 298	Special Topics in Education	1-3

ELA 342	Current Issues In Educational Leadership	3
ELA 350V	Introduction to Educational Leadership in a Global Society	3
ELA 398	Special Topics in Education	1-3
ELA 411	Foundation for School Library Specialists	3
ELA 412	Administration of the School Library	3
ELA 413	Curriculum Role of the School Library Specialist	3
ELA 414	Collection Management and Development in School Libraries	3
ELA 440	Management of Student Services	3
ELA 450	Principles of Education Law and Policy	3
ELA 455	Principles of Education Budgeting and Finance	3
ELA 485	Elements of Research	3
ELA 499	Internship	3

### Graduate Program Information

The mission of the Department of Educational Leadership and Administration at New Mexico State University is to prepare and graduate capable, skillful and dynamic educational leaders for a diverse society. Through the use of theory and practice we aim to develop change agents and role models for socially-just educational systems.

Students studying in these programs are generally interested in the following categories:

- Those seeking preparation for careers as educational leaders and administrators in Pk-12 school sectors. Positions most commonly sought are principals, superintendents, supervisors, program directors, central office staff and state education agency leaders.
- Those seeking preparation for administrative and leadership careers in higher education at the community college and university level, as well as in technical-vocational education. This particular focus can include preparation for the professoriate.
- Those seeking preparation for careers in educational research, agency and program evaluation, and educational management technology. Positions cover placement in a broad range of employment situations within school districts, community colleges, universities, government and industry.

### Admission

Applicants must meet the basic admission requirement of the Graduate School before they are considered for admission to ELA. The department requires full admission to any ELA program before starting coursework. The department will dis-enroll any student who has not been admitted to a graduate degree program and, additionally, will not allow them to enroll in other ELA coursework.

Detailed information on programs may be obtained on the website at <http://ela.nmsu.edu/> or by writing the department. For additional information on degree requirements, consult the Graduate School and College of Education policies listed in "General Information (<http://nmsu-preview.courseleaf.com/nmsu/education/educational-leadership-admin>)" section of this catalog. Specific criteria for each program are available from the Department of Educational Leadership and Administration.

## Admission to ELA Classes

Admission to ELA coursework is generally done by cohort. Registration in any ELA 500-level course requires

1. full admission to the ELA department, or
2. admission to another COE graduate degree department, and
3. consent of the ELA Programs Coordinator and/or ELA Department Head.

## Minimum Grade Requirement

Students must earn a minimum of a "B-" grade in all required ELA coursework. Students who receive a grade of "C+" or below will be required to retake the course.

## Graduate Assistantships

Some graduate assistantships are available in the department. Interested persons should inquire at an early date. Graduate Assistantship applications are available at <http://ela.nmsu.edu/index/student-resources/>.

## Degrees for the Department

Educational Administration - Master of Arts (p. 507)

Educational Administration - Doctor of Education (p. 508) (ELDP)

Educational Administration - Doctor of Philosophy (p. 508) (ELDP)

## Minors for the Department

Educational Leadership and Administration - Undergraduate Minor (p. 507)

PK-12 School Administration - Graduate Master's Minor (p. 509)

Higher Education Administration - Graduate Master's Minor (p. 509)

PK-12 and Higher Education - Graduate Doctorate Minor (p. 509)

### Associate Professor, Azadeh F. Osanloo, Interim Department Head

**Associate Professors** Christman, Prentice, Williams Pichon; **Assistant Professors** Guillaume, Kew; **College Associate Professors** Hannan; **College Instructor** Rodríguez-Strawn; **Emeritus Professors** Armendáriz, Dominguez, González, Ivory, Townley

*A.F. Osanloo, Ph.D., Interim Department Head (Arizona State University)– educational equality, educational leadership and policy, philosophical foundation of education, issues of race, class, and gender in civic education; D. Christman, Ed.D. (Oklahoma State University)– educational administration, higher education, educational change processes, gender and American Indian issues, multicultural leadership; R. Guillaume, Ph.D. (New Mexico State University)- student development theory, biracial/multicultural identity development, higher education administration; J.M. Hannan, Ph.D. (New Mexico State University)– distance education administration, best practices in teaching distance education, student services for distance education students; K. Kew, Ph.D. (Boston College)– educational change and reform, educational leadership, school culture, micro-politics; M. Prentice, Ph.D. (University of Texas at Austin)- community college administration, service learning issues, best practices in teaching higher education; ; D. Rodríguez-Strawn, M.A. (New Mexico State University)- higher education administration, service learning practitioner, SLED program developer, teaching higher education; H. Williams Pichon, Ph.D. (University of New Orleans)#higher education administration, access and persistence of*

*historically underrepresented groups in higher education, college student development, research*

### Emeriti Professors

*A. L. Armendáriz, Ph.D. (University of New Mexico - emeritus)– school administration, leadership development, organizational theory; R. Dominguez, Ph.D. (New Mexico State University - emeritus)- educational administration, higher education, community college administration, leadership development; M.L. González, Ph.D. (New Mexico State University)– leadership in public school administration, multicultural organizations; C. T. Townley, Ph.D. (University of Michigan - emeritus)– knowledge management, higher education*

## Educational Leadership Administration Courses

### ELA 215. Multicultural Leadership in Education 3 Credits

Introduction to the social and cultural constructions of gender, class, and race. Students will critically apply theoretical constructs to everyday life and discuss the intersection of gender and race with class inequality in national and global contexts. Using a social justice framework, readings, and assignments integrate a variety of racial/ethnic groups while considering the effects of historically uneven resource distribution, unearned privilege, forms of domination and subordination, immigration status, and cultural representation and ideologies. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection.

### ELA 255. Leadership and Change in Education 3 Credits

This course will introduce students to the challenges and key strategies in initiating, implementing, and sustaining educational change and reform. In the first part of the course, participants will learn about the challenges of educational change in the United States and the role that they as school leaders play in facilitating change and reform. The course continues with an examination of how culture, micro-politics, and power structures support or impede national and global change initiatives. The last part of the course offers suggestions for change agents including community organizing, culture building, and embracing sustainable leadership practices. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection.

### ELA 298. Special Topics in Education 1-3 Credits (1-3)

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits. Restricted to Las Cruces campus only.

### ELA 342. Current Issues In Educational Leadership 3 Credits

This course addresses issues such as the rise in international education, education's costs, social media's role and influence, changes in state and national funding trends, student and faculty/staff diversity, among others. The focus of this course is centered on the actions and responses of administrators to the current issues they are facing.

**ELA 350V. Introduction to Educational Leadership in a Global Society  
3 Credits**

Multinational educational systems covered through knowledge of the U.S. system of education promoting critical leadership roles every citizen plays in the success of educational systems.

**ELA 398. Special Topics in Education  
1-3 Credits (1-3)**

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated for a maximum of 12 credits.

**ELA 411. Foundation for School Library Specialists  
3 Credits**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELA 511. May be repeated up to 3 credits.

**ELA 412. Administration of the School Library  
3 Credits**

Principles and practices related to the function, structure, and management of school libraries. Same as ELA 512. May be repeated up to 3 credits.

**ELA 413. Curriculum Role of the School Library Specialist  
3 Credits**

Introduction to the integration of curriculum in school library programs. Current trends in collaborative planning and teaching between the school librarians and teachers. Taught with ELA 513. May be repeated up to 3 credits.

**ELA 414. Collection Management and Development in School Libraries  
3 Credits**

Principles of identifying, selecting, acquiring, managing, and evaluating information for school libraries. Same as ELA 514. May be repeated up to 3 credits.

**ELA 440. Management of Student Services  
3 Credits**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) for early entry level positions. This course will provide students with an examination of foundations and principals of student services. Important theories and essential competencies needed in order to be successful will be explored through a social justice perspective of leadership.

**ELA 450. Principles of Education Law and Policy  
3 Credits**

Overview of the use of law and policy in schools and higher education. May be repeated up to 3 credits. Restricted to: E AD, majors.

**ELA 455. Principles of Education Budgeting and Finance  
3 Credits**

Analysis of budget and finance practices in education. Restricted to: EMD majors.

**ELA 485. Elements of Research  
3 Credits**

This course provides students with a foundation for understanding educational research. The course will also provide grounding in proper writing format for use in the education profession. Students will be introduced to various research paradigms and the symbiosis of theory and practice. Besides introducing students to the symbiosis of theory and practice, students will complete assignments and activities that demonstrate the use of that symbiosis. Ultimately, students will be able to use the knowledge they gain through the course to be able to critique educational research.

**ELA 499. Internship  
3 Credits**

The undergraduate Educational Leadership major requires that students complete two internships. Internships provide students with either experience working in an area of administration that is different from the student's regular job or experience conducting research for a program or project. Each internship placement site and scope of work is determined through consultation with the course instructor. Students must complete 120 hours of work with the selected internship site. May be repeated up to 6 credits. Restricted to: EL majors.

**Prerequisite(s):** Student must be an EL major and be within (at least) one year of graduation.

**ELA 502. Special Problems.  
1-3 Credits**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits. Consent of Instructor required.

**ELA 511. Foundation for School Library Specialists  
3 Credits**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELA 411. May be repeated up to 3 credits.

**ELA 512. Administration of the School Library  
3 Credits**

Principles and practices related to the function, structure, and management of school libraries. Same as ELA 412. May be repeated up to 3 credits.

**ELA 513. Curriculum Role of the School Library Specialist  
3 Credits**

Introduction to the integration of curriculum in school library programs. Current trends in collaborative planning and teaching between school librarians and teachers. Same as ELA 413. May be repeated up to 3 credits.

**ELA 514. Collection Management and Development in School Libraries  
3 Credits**

Principles of identifying, selecting, acquiring, managing, and evaluating information for school libraries. Same as ELA 414. May be repeated up to 3 credits.

**ELA 530. Management of Educational Change  
3 Credits**

Leadership in implementing innovations in education. Consent of Instructor required.

**ELA 531. Special Education Administration  
3 Credits**

Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards. Consent of Instructor required.

**ELA 540. Management of Student Services in Higher Education  
3 Credits**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services. Consent of Instructor required.

**ELA 550. Higher Education Law  
3 Credits**

This course is designed to review the impact of the legal process and the judiciary on higher education. Consent of Instructor required.

**ELA 555. Higher Education Finance and Funding****3 Credits**

This course examines the impact and process of financing and funding higher education. Consent of Instructor required.

**ELA 563. Higher Education Administration****3 Credits**

This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. Consent of Instructor required.

**ELA 564. Internship Public Schools Part I****3 Credits**

First half of a practical internship in Pk-12 schools under supervision of school administrator. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** 18 cr. of ELA coursework, 3 years of Pk-12 teaching experience and consent of instructor.

**ELA 565. Internship: Public Schools Part II****3 Credits**

Second half of a practical internship in Pk-12 administrative setting under supervision of experienced higher education administrator. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** ELA 564.

**ELA 566. Internship: Higher Education Part I****3 Credits**

First half of practical internship in administrative setting under supervision of experienced higher education administrator. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** 15 credits of ELA coursework and consent of instructor.

**ELA 567. Internship: Higher Education Part II****3 Credits**

Second half of a practical internship in an administrative setting under supervision of an experienced higher education administrator. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** ELA 566.

**ELA 568. Topics in School Administration****1-3 Credits**

Designated by subtitle.

**ELA 569. Basing Decision on Data: Higher Education.****3 Credits**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. Consent of Instructor required.

**ELA 570. Educational Leadership, Supervision, and Evaluation****3 Credits**

Leadership, supervision, and evaluation in Pk-12 and post secondary education. Consent of Instructor required.

**ELA 572. History and Philosophy of Education****3 Credits**

An overview of the historical development of the American school system and the relation of various philosophies to American education.

**ELA 575. The Principalship****3 Credits**

Key issues surrounding the role of school-site leaders. Consent of Instructor required.

**ELA 576. Educational Financial Management****3 Credits**

Educational finance and business applications. Consent of Instructor required.

**ELA 578. Leadership and Administration of Bilingual Education****3 Credits**

Concepts and practical approaches to improving the education of English languages learners through higher education. Consent of Instructor required.

**ELA 579. Public School Law****3 Credits**

Legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required.

**ELA 580. Administration of Adult and Continuing Education****3 Credits**

Administration of programs in public schools, higher education, community and nontraditional educational settings. Consent of Instructor required.

**ELA 582. Community College Administration****3 Credits**

An overview of the history, role, objectives and patterns governing the effectiveness of the community college. Consent of Instructor required.

**ELA 585. Elements of Research****3 Credits**

Survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required.

**ELA 586. Multicultural Leadership in Education****3 Credits**

Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. Consent of Instructor required.

**ELA 589. Evaluation Design in Education****3 Credits**

This course focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required.

**ELA 590. Basing Decision on Data: Pk-12****3 Credits**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. May be repeated up to 3 credits. Consent of Instructor required.

**ELA 595. Current Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits.

**ELA 598. Independent Studies****1-3 Credits**

Individual investigation in special topic areas. Requires prior approval of project advisor.

**ELA 600. Doctoral Research****1-15 Credits**

Research. S/U to traditional grade options. May be repeated up to 88 credits. Consent of Instructor required. Thesis/Dissertation Grading.

**ELA 620. Doctoral Seminar****1-3 Credits**

A study of current issues in educational administration at the national, state, and local levels. May be repeated up to 6 credits. Consent of Instructor required.

**ELA 622. Quantitative Research I****3 Credits**

Explores quantitative research methods, the rationale and assumptions that guide statistical decisions, beginning level statistical analyses, and how all of these are applied in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ELA 623. Qualitative Research I****3 Credits**

Explores qualitative research methods and models and their application in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ELA 630. Concepts of Leadership in Education****3 Credits**

Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. May be repeated up to 3 credits. Consent of Instructor required.

**ELA 635. Scholarly Writing and the Southwest Border****3 Credits**

This course is designed to provide doctoral-level students with an opportunity to engage with scholarly and academic writing in a meaningful manner. Scholarly writing and academic writing are often used interchangeably. They will be used in that manner for this course. Generally defined, academic writing refers to a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise. Scholarly writing is the specific genre of writing that is used in all academic fields. For this course, the scholarly writing is contained to the context of the Southwest Border and Borderland issues. This is designed in consideration of and relates to the Department and Program's mission, which takes into account social justice and border education issues. Additionally, the course will cover topics associated with scholarly writing that include, but not limited to: formal language, tone, precision, clarity, word choice, and assumptive statements versus research-supported rationale. Consent of Instructor required. Restricted to: E AD majors.

**ELA 645. The Professoriate****3 Credits**

The purpose of this course is to explore the body of scholarly knowledge and research appropriate for the study of American higher education, the context in which teaching and learning occurs, and faculty's roles in the process. We will discuss the number, variety, and purpose of the various types of institutions; the different roles that faculty members play within these institutions; how faculty work is assessed and valued within the outside of the university; administrative regulations related to faculty work; current issues related to the general state of the professoriate; as well as how does one prepare to enter the professoriate.

**ELA 650. Higher Education Law****3 Credits**

This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. Consent of Instructor required.

**ELA 655. Higher Education Finance and Funding****3 Credits**

This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. Consent of Instructor required.

**ELA 670. Advanced Internship****1-6 Credits**

For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E AD majors. S/U Grading (S/U, Audit).

**ELA 671. Foundations of Educational Administration****3 Credits**

Advanced course about the political, economic, and social forces on policy making and governance of Pk-12 and postsecondary education. May be repeated up to 3 credits. Consent of Instructor required.

**ELA 676. Educational Financial Management****3 Credits**

This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. Consent of Instructor required.

**ELA 679. Public School Law****3 Credits**

Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required.

**ELA 682. Quantitative Research II****3 Credits**

Intermediate quantitative methods of research, statistical analyses, and their application in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Doctoral students only.

**Prerequisite(s):** ELA 622.

**ELA 683. Qualitative Research II****3 Credits**

Advanced qualitative methods of research and implementation in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** ELA 623.

**ELA 685. Elements of Research****3 Credits**

Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required.

**ELA 689. Evaluation Design in Education****3 Credits**

Advanced course that focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required.

**ELA 693. Dissertation Seminar****3 Credits**

Same as BIL, C EP, ECED, EDUC, RDG, SPED 693. Consent of Instructor required.

**ELA 698. Selected Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits per semester and overall total: May be repeated up to 9 credits.

**ELA 700. Doctoral Dissertation****9 Credits**

Dissertation. Minimum of 3 credits per regular semester. May be taken for a maximum of 36 credits. Consent of instructor required.

**Contact Person:** Denise Rodriguez-Strawn

**Office Location:** O'Donnell Hall Rm 205A

**Mailing Address:** New Mexico State University, P.O. Box 30001-MSC 3N, Las Cruces, NM 88003-8001

**Physical Address:** New Mexico State University, 1220 Stewart Street, O'Donnell Hall Rm. 205A, Las Cruces, NM 88003-8001

**Phone:** (575) 646-3825

**Email:** edmandev@nmsu.edu

**Website:** <http://ela.nmsu.edu/>

## Educational Leadership and Administration - Undergraduate Minor

A minor in educational leadership and administration is available to a student receiving a bachelor's degree from another department in the university. The minor in educational leadership and administration is designed to be useful to the undergraduate who is preparing to work as a teacher or staff member in educational organizations such as primary schools, community colleges and universities.

**Required Courses**

ELA 215	Multicultural Leadership in Education	3
ELA 255	Leadership and Change in Education	3
ELA 342	Current Issues In Educational Leadership	3
ELA 398	Special Topics in Education	3
ELA 450	Principles of Education Law and Policy	3
ELA 455	Principles of Education Budgeting and Finance	3

Total Credits 18

**How To Apply**

If you wish to complete a minor in Educational Leadership and Administration (ELA), you should complete the ELA minor application/verification form and return it to the Educational Leadership and Administration Department during the semester in which you will be completing your ELA minor coursework. This form notifies the registrar of your intention. It insures that if you complete the requirements for the minor, it will be officially recorded in your transcript.

## Educational Administration - Master of Arts

The Master of Arts (M.A.) in educational administration focuses on two areas: Pk-12 school administration and higher education. The program of study for Pk-12 school administration includes all coursework and internships required by the New Mexico Public Education Department for Administrative Licensure.

Students must earn a minimum of a "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course.

In addition, students must successfully complete a final department examination, generally done during the final semester of coursework.

The department does not offer the thesis option.

## Admission Application: Pk-12 School Administration

Grade point average requirements for the master's program are consistent with those of the Graduate School. However, in addition to these requirements, all master's degree applicants must provide, to the department, a one-page letter of application indicating career interests and reasons for wanting to pursue a master's degree in the department; a professional résumé; a two-page professional or academic writing sample; official document showing three years of Pk-12 teaching experience; copy of current U.S. teaching license; and three letters of recommendation. The letters of support must be mailed directly to the department from the writer. The ELA admissions committee bases admissions decisions on this portfolio and will not consider incomplete applications.

### Prerequisites: Pk-12 School Administration

Students interested in the Pk-12 school administration must have a current U.S. teaching license and three years of full-time teaching experience in the Pk-12 sector.

### Application Deadline: Pk-12 School Administration

This program begins in the spring semester only. All materials for this program must be received by the deadline specified on the ELA website. Admission requirements are available from the Department of Educational Leadership and Administration, or on the website at <https://ela.nmsu.edu/index/academics/mainal/>. Students will be informed upon their formal acceptance into the program.

## Program Delivery: Pk-12 School Administration

The department uses a hybrid distance education program combining both asynchronous and synchronous delivery technologies. The internships require attendance at monthly seminars that are held face-to-face on the Las Cruces campus. There is a mandatory face-to-face orientation in Las Cruces prior to the start of the spring semester, January. All other coursework is online.

### Pk-12 Required Coursework, 33 credit hours

ELA 530	Management of Educational Change	3
ELA 531	Special Education Administration	3
ELA 564	Internship Public Schools Part I	3
ELA 565	Internship: Public Schools Part II	3
ELA 570	Educational Leadership, Supervision, and Evaluation	3

ELA 575	The Principalship	3
ELA 576	Educational Financial Management	3
ELA 578	Leadership and Administration of Bilingual Education	3
ELA 579	Public School Law	3
ELA 586	Multicultural Leadership in Education	3
ELA 590	Basing Decision on Data: Pk-12	3
Total Credits		33

## Admission Application: Higher Education Administration

Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission. In addition, applicants must provide, to the ELA department, a one-page letter of application indicating career interests and reasons for wanting to pursue a master's degree; a professional résumé; a two-page professional or academic writing sample; and three letters of recommendation. The letters of support must be mailed directly to the department from the writer. The ELA admissions committee will not consider incomplete applications.

### Prerequisite: Higher Education Administration

Students interested in higher education administration must have a bachelor's degree.

### Application Deadline: Higher Education Administration

This program begins in the spring semester only. All materials for this program must be received by the deadline specified on the ELA website. Admission requirements are available from the Department of Educational Leadership and Administration, or on the website at <http://ela.nmsu.edu/index/academics/mainhied/>. Students will be informed upon their formal acceptance into the program.

## Program Delivery: Higher Education Administration

There is a mandatory face-to-face orientation in Las Cruces prior to the start of the spring semester, January. All other classes are 100% online, distance delivery.

### Higher Education Required Coursework, 33 credit hours

ELA 530	Management of Educational Change	3
ELA 540	Management of Student Services in Higher Education	3
ELA 550	Higher Education Law	3
ELA 555	Higher Education Finance and Funding	3
ELA 563	Higher Education Administration	3
or ELA 582	Community College Administration	
ELA 566	Internship: Higher Education Part I	3
ELA 567	Internship: Higher Education Part II	3
ELA 569	Basing Decision on Data: Higher Education.	3
ELA 580	Administration of Adult and Continuing Education	3
ELA 585	Elements of Research	3
ELA 586	Multicultural Leadership in Education	3
Total Credits		33

## Educational Administration - Doctor of Education

### Educational Leadership Doctoral Program (ELDP)

The Department of Educational Leadership and Administration (ELA) offers both the Doctor of Education (Ed.D.) and the Doctor of Philosophy (Ph.D.)

The Doctor of Education is geared toward those students wishing to pursue a degree which will help them in their profession. Coursework, internships, and research are constructed to develop individuals for administrative position in Pk-12 schools in post secondary institutions.

The Doctor of Philosophy is a research-oriented degree. Coursework and internships are directed toward developing research proficiencies in educational leadership. The Ph.D. also requires additional hours of coursework in an approved cognate area.

### Admission

The department requires applicants to complete a Doctoral Admissions Portfolio. Specific details and criteria are available from the Department of Educational Leadership and Administration or on the website at <https://ela.nmsu.edu/index/academics/docpage/>.

### For More Information

Please do not hesitate to contact the ELA Department if you have any questions related to ELDP. Feel free to send an e-mail message to [edmandev@nmsu.edu](mailto:edmandev@nmsu.edu) ([edmandev@nmsu.edu](mailto:edmandev@nmsu.edu)) or call (575) 646-3825.

## Educational Administration - Doctor of Philosophy

### Educational Leadership Doctoral Program (ELDP)

The Department of Educational Leadership and Administration (ELA) offers both the Doctor of Education (Ed.D.) and the Doctor of Philosophy (Ph.D.)

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## Educational Administration - Graduate Minor

Master's students may earn a minor in educational administration, with a focus in Higher Education Administration, by passing **three** of the listed classes below.

### Minimum Grade Requirement

Students must earn a minimum "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course.

ELA 563 or ELA 582	Higher Education Administration Community College Administration	3
ELA 550	Higher Education Law	3
ELA 555	Higher Education Finance and Funding	3
ELA 540	Management of Student Services in Higher Education	3

## Educational Administration - Graduate Minor

Master's level students wishing to earn a minor in educational administration, with a focus in Pk-12 Educational Administration, must pass **three** of the listed classes below.

### Minimum Grade Requirement

Students must earn a minimum "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course.

ELA 570	Educational Leadership, Supervision, and Evaluation	3
ELA 575	The Principalship	3
ELA 576	Educational Financial Management	3
ELA 579	Public School Law	3

## Educational Administration - Graduate Minor

### Doctoral Graduate Minor

Doctoral students who wish to earn a minor in Educational Leadership and Administration should meet with an ELA faculty member to discuss program and/or courses. NOTE: Faculty will prescribe a plan of study for the minor that takes into consideration the career aspirations and goals of the student.

## Kinesiology and Dance Undergraduate Program Information

The Department of Kinesiology and Dance provides students with the education necessary to pursue careers in allied health sciences (medicine, physician's assistant, physical therapy, occupational therapy, etc.), athletic training, physical education, dance and dance education and for a variety of careers in the fitness and wellness industry. Details

of the degree programs and their respective concentrations are provided below.

The department also offers minors in dance and exercise science.

## Graduate Program Information

The PhD in Kinesiology encompasses opportunities for focused study in physiological, biomechanical, psychological, and pedagogical domains of human movement. Program emphasis is placed on the acquisition of skills needed for high quality research and innovative teaching. Students are expected to become proficient in research methods within their respective areas of interests. The program prepares students for postdoctoral or faculty positions in higher education, or positions in applied sport and clinical settings. Students are expected to work with specific faculty members to explore interests in Biomechanics, Exercise Physiology, Strength & Condition, Aging, Physical Education, Dance and Sport Psychology & Motor Behavior.

### Admission

The Department of Kinesiology and Dance offers a Doctorate of Philosophy (PhD) in Kinesiology. To maximize consideration for admittance (for a recommended August start date), candidates should submit applications by January 15 of that same year.

Students will be admitted to graduate study on the basis of their potential for achievement in research, scholarship and teaching. The most promising applicants will be accepted. Because the number of students that the department can successfully accommodate is limited, it will not always be possible to admit all qualified applicants. The admissions committee will consider any material that a candidate for admission wishes to present. Application forms and instructions are available here:<http://prospective.nmsu.edu/graduate/apply/index.html>. <http://prospective.nmsu.edu/graduate/apply/index.html>. The minimum application consists of the following:

1. A completed Graduate School admission application.
2. Complete transcripts of all college work, reflecting a bachelors and a masters degree (or 30 hours of graduate work) in a related field of study, and a minimum cumulative GPA of 3.0 in prior degree programs.
3. Scores on the Graduate Record Examination (there is no minimum requirement; however, the scores will be considered in the admission decision).
4. Three letters of recommendation from professors, employers or others qualified to evaluate your potential for graduate work.
5. A curriculum vitae or resume.
6. A personal statement explaining how graduate work at NMSU fits your educational and career goals, and,
7. An indication of the faculty members whose work is of particular interest to you, and a letter of support from at least one faculty member indicating an interest in guiding you through your program of studies.

## Degrees for the Department

Dance - Bachelor of Arts in Dance (p. 525)

Athletic Training - Bachelor of Science in Athletic Training (p. 522)

Kinesiology - Bachelor of Science in Kinesiology (p. 527)

Kinesiology - Doctor of Philosophy (p. 533)

## Minors for the Department

Dance - Undergraduate Minor (p. 532)

Exercise Science - Undergraduate Minor (p. 533)

### Professor, TBA Academic Department Head

**Professors** Berning, Knapp, Oliver, Wood; **Associate Professor** Gear, Gilpin, Keeley, Post; **Assistant Professors** Aiken, An, Aranda, Lee, Meyer, O'Connell; **Instructor** Gavitt

**Graduate Faculty:** Phillip G. Post, Graduate Program Coordinator, PhD (Associate Professor, University of Tennessee), Christopher A. Aiken (Assistant Professor, Louisiana State University), Yong Woo An (Assistant Professor, University of Delaware), Joseph M. Berning, PhD (Professor, University of Nebraska), William S. Gear, PhD (Associate Professor, University of Pittsburgh), Frank G. "Paco" Gilpin, MS (College Associate Professor, New Mexico State University), David W. Keeley, PhD (Associate Professor, University of Arkansas), Debra W. Knapp, EdD (Professor, New Mexico State University), Sang-Rok, Lee (Assistant Professor, Florida State University), Kimberly L. Oliver, PhD (Professor, Virginia Polytechnical Institute), Robert H. Wood, PhD (Professor, Louisiana State University).

**Instructional Faculty:** Raquel S. Aranda, MS (College Assistant Professor, New Mexico State University), Ann N. Gavitt, MS (College Instructor, New Mexico State University), Shon Meyer, MS (College Assistant Professor Instructor, University of Idaho), Kimberly O'Connell, MS (College Assistant Professor, California University of Pennsylvania).

phone: (575) 646-2216

website: <https://kind.nmsu.edu/kin/>

## Dance Courses

### DANC 101G. Dance Appreciation

#### 3 Credits

An investigation of movement, dance and choreographic work as a vehicle for understanding culture. Includes concepts in dance appreciation, themes and purposes of dance analysis of dance works, exposure to different styles of dance and understanding the roles and effects of major historical periods. Restricted to: Main campus only.

### DANC 102. Introduction to Hip-Hop Dance

#### 1 Credit

This course is an introduction to Hip-Hop dance. The movement material will cover West coast and Southern styles with the inclusion of the history and evolution of Hip-Hop dance. No previous dance experience required. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

### DANC 109. Argentine Tango I

#### 1 Credit

Introduction to skills and techniques of Argentine Tango.

### DANC 118. West Coast Swing I

#### 1 Credit

Students will learn to dance the smooth style of Swing. The West Coast Swing may be danced to ANY style of music that has a beat (Country, R&B, Hip Hop, Disco, House). Also featured is the Hustle (fast paced and exhilarating). May be repeated up to 4 credits. Restricted to Las Cruces campus only.

### DANC 120. Ballet Folklorico I

#### 1 Credit

Introductory course in folklorico dances of New Mexico and Mexico. May be repeated for a maximum of 2 credits.

### DANC 121. Beginning Country Western Dance

#### 1 Credit

Beginning Country Western dance, including Country Western two-step, nightclub two-step, polka, and Country Western line dance. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

### DANC 122. Introduction to Latin Social Dance

#### 1 Credit

Introduction to Latin social dance for non dance majors. Students will learn basic Latin dance technique and partnering work. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

### DANC 123. Ballet Technique I

#### 1 Credit

Introduction to basic ballet technique, vocabulary, and history. Includes practical application of anatomical placement, posture and control through participation and academic study. May be repeated for a maximum of 2 credits.

### DANC 124. Jazz Technique I

#### 1 Credit

Introduction to basic jazz technique, styles, and history through participation and academic study. May be repeated for a maximum of 2 credits.

### DANC 125. Introduction to Ballroom Dance

#### 1 Credit

Introduction to ballroom dance for non dance majors. Students will learn basic ballroom technique and partnering work. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

### DANC 126. Modern Dance Technique I

#### 1 Credit

Introduction to and development of basic modern dance technique, history, and aesthetics through participation and academic study. May be repeated for a maximum of 2 credits.

### DANC 127. Tap Dance I

#### 1 Credit

Introduction to skills and techniques of tap dance. May be repeated for a maximum of 2 credits.

### DANC 128. Latin Club Dance

#### 1 Credit

Introduction to the most popular Latin Club Dances to include the Salsa, Merengue, and Bachata. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

### DANC 129. Flamenco I

#### 1 Credit

Introduction to skills and techniques of flamenco dance. May be repeated for a maximum of 2 credits.

### DANC 151. Master Works

#### 1 Credit

This course investigates the work of master choreographers in contemporary, Spanish, and social dance styles. Students will engage in exploring concepts in dance appreciation, themes and purposes of dance by analyzing dance works using principles, elements, and process of compositional design. This course will require students to communicate their opinions through verbal discussions, group projects, and written assignments. Restricted to Las Cruces campus only.

**DANC 200. Dance Pedagogy: Educational Theory****1 Credit**

This course will examine how people learn cognitively, physically, and emotionally so that students can become better at self-teaching and self-assessment. Students will study several educational theories and how they relate to dance. Restricted to Las Cruces campus only.

**DANC 202. Dance Ensemble****1 Credit**

This course will include learning the elements of dance composition. The students in this course will be the dancers for the students in Dance Choreography II. This course is a requirement for freshman dance majors whose emphasis is in contemporary dance. May be repeated up to 2 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 203. Dance Production I****1 Credit**

Students will learn the production process of dance events which may include performances, festivals, workshops, conferences. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 204. Dance Sport I****1 Credit**

Performance-based, team formation dance in a variety of Latin and ballroom dances. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of instructor and one of DANC 121, DANC 122, DANC 125, or DANC 128.

**DANC 205. Contemporary Dance Ensemble I****1 Credit**

Performance-based instruction for students pursuing a career in contemporary dance. Instruction includes contemporary dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 206. Spanish Dance Ensembles I****1 Credit**

Performance-based instruction for students pursuing a career in dance with an emphasis in Spanish Dance. Instruction includes dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 209. Argentine Tango II****1 Credit**

Intermediate study in Argentine tango. Learn advanced patterns, techniques and partnering skills. May be repeated up to 2 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of instructor.

**DANC 210. Classical Spanish II****2 Credits (1+3P)**

The study of the theory, techniques, and practice of Classical Spanish at the intermediate level. Includes historical and cultural contexts of this art form. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 129.

**DANC 212. Intermediate Hip-Hop Dance****2 Credits**

This course is for students who have experience in Hip-Hop dance. The movement material will cover West coast and Southern styles with the inclusion of the history and evolution of Hip-Hop dance. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 218. West Coast Swing II****2 Credits**

Students will take their West Coast Swing & Hustle to the next level. Learn Intermediate and Advanced figures and techniques in both dances. Students will also enjoy advanced study on musicality and blending to create new amalgamations as well as practice in advanced leading & following techniques. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 118.

**DANC 221. Country Western Dance****2 Credits**

Intermediate skills in country/western two-step, nightclub two-step, polka, and Western line dances. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 121 or consent of instructor.

**DANC 222. Bronze American Rhythm****2 Credits (1+2P)**

Bronze level American Rhythm patterns, techniques, and partnering with emphasis on elements of dance. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 223. Ballet Technique II****2 Credits**

Continued study of classical ballet technique, vocabulary, and history through participation and academic study. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 224. Jazz Technique II****2 Credits**

Continued study of jazz technique and history through participation and academic study. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 225. Bronze American Smooth****2 Credits (1+2P)**

Bronze level American Smooth patterns, technique, and partnering with an emphasis on the elements of dance. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 125 or consent of instructor.

**DANC 226. Modern Dance Technique II****2 Credits**

Continued study of postmodern dance technique and history through participation and academic study. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 227. Tap Dance II****1 Credit**

Continued study of skills and techniques of tap dance at the advanced level. May be repeated for a maximum of 2 credits.

**Prerequisite:** DANC 127 or consent of instructor.

**DANC 229. Flamenco II****2 Credits**

The study of theory, techniques and practice of Flamenco at the intermediate level. Includes historical and cultural contexts of this art form. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** Dance 129.

**DANC 232. Bronze International Latin****2 Credits**

This is the style of Latin dance that is danced around the globe and is featured in the World DanceSport Championships. Students will learn the Bronze Level figures and techniques in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and the techniques. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 222.

**DANC 235. Bronze International Standard****2 Credits**

This is the style of Ballroom dance that is performed around the globe and is featured in the World DanceSport Championships. Learn the Bronze Level figures and techniques in five (5) International Style dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on understanding technical Elements of Dance, memorizing and performing routines. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 225.

**DANC 269. DanceSport Choreography I****2 Credits**

An introduction to the process and theory behind creating original choreography for both performance and competition level dance. With focus on the individual couple, gain necessary skills, knowledge and practice in choreographing Ballroom, Latin, Swing &/or Nightclub dance routines in various practical settings. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 275. Dance Studio Management****3 Credits**

The study and practice of studio management. Includes study of financial procedures, marketing, entrepreneurship, leadership, management, fundraising and other related topics. Restricted to majors and minors.

**DANC 279. Flamenco Choreography I****2 Credits**

Students develop and perform solo dance studies with an emphasis placed on the development of personal movement vocabulary, phrase building, and the exploration of choreographic tools for Flamenco on stage. Discussion, critiquing, and descriptive writing about their choreographic processes will supplement direct physical work. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 280. Improvisation I****1 Credit**

Introduction and development of basic movement improvisation skills.

**DANC 289. Principles of Choreography I****2 Credits**

Solo dance choreography technique. Course must be passed with a grade of C or higher. Consent of instructor required. Restricted to: Main campus only. Restricted to Dance Majors Dance Minors majors.

**DANC 300. Dance Pedagogy: Creative Movement****3 Credits**

Teaching methods and class planning for creative movement dance curriculum at preschool and elementary school levels. Restricted to Las Cruces campus only.

**DANC 301. Flamenco Pedagogy I****3 Credits**

The methods and theory of teaching Flamenco dance forms particularly in the studio environment. Consent of Instructor required.

**Prerequisite(s):** DANC 229 AND DANC 206.

**DANC 303. Dance Production II****1 Credit**

Students will learn the production process of dance events which may include performances, festivals, workshops, conferences.

**Prerequisite(s):** DANC 203.

**DANC 304. Dance Sport II****1 Credit**

Advanced performance-based, team formation dance in a variety of Latin and social dances. May be repeated up to 4 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor and one of DANC 121, DANC 122, DANC 125, or DANC 128.

**DANC 305. Contemporary Dance Ensemble II****1 Credit**

Advanced performance-based instruction for students pursuing a career in contemporary dance. Instruction includes contemporary dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 6 credits. Consent of Instructor required.

**DANC 306. Spanish Dance Ensemble II****1 Credit**

Performance-based instruction for students pursuing a career in dance with an emphasis in Spanish Dance. Instruction includes dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 4 credits. Consent of Instructor required.

**DANC 310. Classical Spanish Dance III****3 Credits**

Advanced study of Classical Spanish Dance with castanets, cultural history, and pedagogy methods. A expanded focus on integration of different classical genres with focus on solo work. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 210.

**DANC 322. Silver American Rhythm****3 Credits (2+2P)**

Silver level American Rhythm patterns and technique with emphasis on performance. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 222.

**DANC 323. Ballet Technique III****3 Credits**

Intermediate/advanced study of ballet technique, including vocabulary and history. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 223 or consent of instructor.

**DANC 324. Jazz Technique III****3 Credits**

Advanced study of jazz dance, including vocabulary and history. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 224 or consent of instructor.

**DANC 325. Silver American Smooth****3 Credits (2+2P)**

Silver level American Smooth patterns and technique with emphasis on performance. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 225.

**DANC 326. Modern Dance III****3 Credits**

Intermediately advanced-level modern dance technique and study of current dance aesthetics. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 226 or consent of instructor.

**DANC 329. Flamenco III****3 Credits**

Advanced study in flamenco dance technique, its cultural history and pedagogy methods. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**DANC 332. Silver International Latin****3 Credits**

Students will learn Silver Level syllabus figures in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and Bronze Level figures in Paso Doble. Continued training and practice in International Style Latin dance technique. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 232.

**DANC 335. Silver International Standard****3 Credits**

Learn Silver Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on increased technical understanding to increase their ability in partnering and musicality. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 235.

**DANC 339. Flamenco Structure and Improvisation****3 Credits**

A Study of various elements necessary in an improvisational setting in Flamenco. Using a cross section of Flamenco forms as a format. Students study the compass of each palo, then move to several traditional letras appropriate to these forms. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 229.

**DANC 342. DanceSport Pedagogy: Rhythm****3 Credits**

In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in four (4) Rhythm Dances to include the Rumba, Cha Cha, East Coast Swing and Mambo. Students will gain practical teacher education in the area of Private Lesson Instruction with required in class practicums. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 222.

**DANC 345. DanceSport Pedagogy: Smooth****3 Credits**

In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in the four (4) American Style Smooth Ballroom Dances to include the Waltz, Foxtrot, Tango and Viennese Waltz. Students will gain practical teacher education in the area of Group Class Instruction with required in class practicums. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 225.

**DANC 365. Dance Pedagogy: Dance in Education****2 Credits**

This course provides the student with methods and theories of dance education. This course will cover methods of teaching core curriculum subjects in an elementary school through body movement. This course will focus on the special needs of a kinesthetic learner.

**DANC 369. DanceSport Choreography II****2 Credits**

Take DanceSport choreography to the next level. With focus on group formation dance, gain necessary skills, knowledge and practice in choreographing Ballroom, Latin, Swing &/or Nightclub dance routines for groups in artistic and competition settings. Consent of Instructor required.

**DANC 379. Flamenco Choreography II****2 Credits**

Students develop and perform group studies with an emphasis placed on the development of ensemble movement vocabulary, phrase building, and the exploration of choreographic tools for Flamenco on stage. Discussion, critiquing, and descriptive writing about their choreographic processes will supplement direct physical work. Level II will advance to small group work as well as mentoring level I students. Consent of Instructor required.

**Prerequisite(s):** DANC 279.

**DANC 380. Improvisation II****1 Credit**

Continued practice in movement improvisation with more complex examination of improvisational structures.

**Prerequisite:** DANC 280.

**DANC 389. Principles of Choreography II****2 Credits**

Continued investigation of the choreographic process with an emphasis on group choreography. Course must be passed with a grade of C or higher. Consent of instructor required. Restricted to: Main campus only. Restricted to Dance majors Dance minors majors.

**Prerequisite(s):** DANC 289.

**DANC 400. Dance Pedagogy II****3 Credits**

Teaching methods and class planning for dance curriculum at middle school and high school levels. May be repeated up to 3 credits.

**DANC 401. Flamenco Pedagogy II****3 Credits**

Advanced methods and theory of teaching Flamenco dance forms particularly in the studio environment. Includes a practicum of eight onsite teaching units in a location to be determined by the designated study. Consent of Instructor required.

**Prerequisite(s):** DANC 229 AND DANC 206.

**DANC 411. Flamenco Practicum****1 Credit**

Directed learning experiences for careers in dance. Provides the student with actual classroom teaching experience for all ages and all levels of dance students. May be repeated up to 4 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 301.

**DANC 412. DanceSport Practicum****1 Credit**

Directed learning experiences for careers in dance. Provides the student with actual classroom teaching experience for all ages and all levels of dance students. May be repeated up to 4 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 342 or DANC 345.

**DANC 413. Dance Practicum II****1 Credit**

This course provides the student with actual classroom teaching experience for all ages and all levels of dance students. With the supervision of the instructor, students will design a practicum experience, choose a site, and implement dance lessons. Course must be passed with a grade of C or higher. May be repeated up to 2 credits. Consent of Instructor required.

**DANC 422. Gold American Rhythm****3 Credits (2+2P)**

Advanced level American Rhythm dance technique and partnering work with choreography and performance emphasized. Includes cultural history and pedagogy methods. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: DANC majors.

**Prerequisite(s):** DANC 322.

**DANC 423. Ballet Technique IV****3 Credits**

Advanced study of ballet technique including vocabulary and history. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 323 or consent of instructor.

**DANC 424. Jazz Dance Technique IV****3 Credits**

Advanced study of jazz dance techniques, including history and aesthetics. May be repeated for a maximum of 6 credits.

**Prerequisites:** DANC 324 or consent of instructor.

**DANC 425. Gold American Smooth****3 Credits (2+2P)**

Gold level American Smooth technique and choreography with an emphasis on performance and competition dancing. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: DANC majors.

**Prerequisite(s):** DANC 325.

**DANC 426. Modern Dance Technique IV****3 Credits**

Advanced study of modern technique, including history and aesthetics. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 326 or consent of instructor.

**DANC 432. Gold International Latin****3 Credits**

Students will complete all syllabus figures through the Gold level in the Rumba, Cha Cha, Samba, Jive and Paso Doble. Advanced training and practice in International Style Latin dance technique. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 332.

**DANC 435. Gold International Standard****3 Credits**

Students will learn Gold Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on physical and cognitive mastery of standard dance technique and elements as well as high-level performance ability, musicality and choreography. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 335.

**DANC 442. DanceSport Pedagogy: Latin****3 Credits**

This teacher education course is designed to prepare future dance professionals in the teaching of the International Style Latin dances: Cha Cha, Samba, Rumba, Paso Doble & Jive. Gain a deep understanding of all elements and be well prepared to take the DVIDA or ISTD professional certification exams. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 232 & 342.

**DANC 445. DanceSport Pedagogy: Standard****3 Credits**

This teacher education course is designed to prepare future dance professionals in the teaching of the International Style Standard dances: Waltz, Tango, Foxtrot & Viennese Waltz. Students will gain a deep understanding of all elements and be well prepared to take the DVIDA or ISTD professional certification exam. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 235 & DANC 345.

**DANC 447. DanceSport Certification Preparation****3 Credits**

The Professional Certification process offers extraordinary benefits to dance teachers, deeply enriching their dancing and teaching, and greatly expanding their career opportunities. This intensive course is designed to fully prepare students in taking the DVIDA and/or ISTD exams in the Smooth, Rhythm, Standard or Latin dances depending on course offered. See subtitle for specific style being taught in schedule of classes. May be repeated up to 12 credits. Consent of Instructor required.

**DANC 450. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**DANC 451V. World Dance****3 Credits**

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HON 347V.

**DANC 462. Flamenco Dance History****3 Credits**

An in depth study of the cross section of Flamenco and Spanish Dance traditions and genres from Spain with the influence of her colonies and the modern world from the early 1400s to Present.

**DANC 465. Senior Culminating Experience****1-6 Credits (1-6)**

Exit course for graduating seniors. Students will apply comprehensive knowledge of performance and production and/or pedagogy experience, to culminate in a dance production and/or teaching project. Restricted to majors and minors. A minimum of 2 credit hours required for graduation.

**DANC 466. Dance Pedagogy: Dance Technique****3 Credits**

Students will learn to develop a curriculum design, apply teaching methods, and structure lesson plans for teaching specific dance styles. Course must be passed with a grade of C or higher. Consent of Instructor required.

**Prerequisite(s):** DANC 300 or consent of instructor.

**DANC 489. Advanced Choreographic Project****2 Credits**

Individual directed studies in choreography with a culminating performance. Consent of Instructor required.

**DANC 499. Problems****1-6 Credits (1-6)**

Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**DANC 501. Directed Studies****1-4 Credits (1-4)**

Supervised projects and/or research in theoretical studies, inclusive of community service projects. May be repeated up to 4 credits. Consent of Instructor required.

**DANC 505. Dance Ensemble III****1 Credit**

Rehearsal and performance of dance repertory with emphasis on advanced understanding of musicality, dynamic phrasing, artistic expression, and athletic versatility within a broad range of styles. May be repeated up to 4 credits. Consent of Instructor required.

**DANC 510. Advanced Theory of Classical Spanish Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in Classical Spanish technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 310.

**DANC 522. Advanced Theory of American Rhythm Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in American Rhythm technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 322.

**DANC 523. Advanced Theory of Ballet Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in ballet technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 423.

**DANC 525. Advanced Theory of American Smooth Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in American Smooth technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 325.

**DANC 529. Advanced Theory of Flamenco Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in Flamenco technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 329.

**DANC 550. Special Topics****1-6 Credits (1-6)**

Specific subjects offered in addition to standard academic curriculum. Course title to be announced in the Schedule of Classes. May be repeated up to 6 credits. Consent of Instructor required.

**DANC 551. Movement as Social Text****3 Credits**

Investigation of the meaning of movement and dance in different cultural, social, and historical contexts in both Western and non-Western dance forms. Emphasis will be placed on the nature of movement, its unique properties, the ways in which it conveys meaning, and its relationship to culture and society. Consent of instructor required.

**DANC 566. Advanced Theory of Dance Pedagogy****1-6 Credits (1-6)**

Advanced study of dance pedagogy theory and practice. May be repeated up to 6 credits. Consent of Instructor required.

**DANC 567. Dance Internship I****2 Credits**

Internship opportunities in either dance education, dance performance/production, or dance administration. Internship site determined by both Director of Dance Program and graduate student. Consent of Instructor required.

**DANC 568. Advanced Theory of Modern Dance Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in Modern dance technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 426.

**DANC 570. Dance Administration and Leadership****2 Credits**

The study and investigation of both management and leadership theories and how to apply these theories in practice.

**DANC 599. Master's Thesis****1-6 Credits (1-6)**

This course is for graduate dance students who choose to write a thesis instead of a performance or teaching project. May be repeated up to 6 credits. Thesis/Dissertation Grading.

**DANC 600. Dance Research****3 Credits**

Literature review and development of research in the field of dance.

**DANC 670. Dance Internship II****3 Credits**

Internship opportunities in either dance education, dance performance/production, or dance administration. Internship site determined by both Director of Dance Program and graduate student.

**DANC 700. Doctoral Dissertation****3 Credits**

This course is for graduate dance students working toward their EdD or PhD in dance. A dissertation is required. Topic and format to be determined by dissertation committee chair and graduate student. Consent of instructor required. Restricted to Graduate Dance Majors majors.

## Physical Education Courses

**P E 102. Beginning Weight Training****1 Credit**

Introduction to basic principles and techniques of weight training.

**P E 103. Beginning Weight Training for Women****1 Credit**

Introduction to basic principles and techniques of weight training as related to women.

**P E 104. Military Physical Fitness****1 Credit**

Directed physical fitness activities designed to develop and maintain muscular strength/endurance, cardiopulmonary efficiency, flexibility, and coordination required for leadership roles after graduation.

**P E 109. Pilates****1 Credit**

Designed exercise program involves the entire body while focusing on strengthening the core muscles of the torso. Exercises promote coordination, balance, and strength.

**P E 112. Beginning Volleyball for Men****1 Credit****P E 113. Beginning Volleyball for Women****1 Credit****P E 114. Basketball for Women****1 Credit****P E 115. Basketball for Men****1 Credit****P E 117. Beginning Soccer****1 Credit**

Introduction to the basic techniques and skills of soccer.

**P E 127. Cardio-Kickboxing****1 Credit**

Activities that mimic punches, blocks, and kicks which have been modified to serve the purpose of providing a cardiovascular workout.

**P E 128. Aerobic Dance****1 Credit**

Designed to increase knowledge of the human body's responses to exercise, enhance the level of muscular development, and cardiovascular endurance with the use of music.

**P E 129. Step Aerobics****1 Credit**

Designed to increase knowledge of the human body's responses to exercise, enhance the level of muscular development, and cardiovascular endurance with the use of music and steps.

**P E 130. Beginning Swimming****1 Credit****P E 131. Aqua Aerobics****1 Credit**

Designed to increase knowledge of the human body's responses to exercise, enhance the level of muscular development, and cardiovascular endurance through exercise in water.

**P E 132. Intermediate Swimming****1 Credit**

Development of fitness through participation in aquatics activities.

**Prerequisite(s):** Ability to swim 200 yards.

**P E 134. Lifeguard Training****2 Credits**

Skills training for a nonsurf lifeguard. Course will include Standard First Aid and CPR certification.

**Prerequisites:** swim 500 yards, dive to 9-foot depth and retrieve a 10-pound brick, surface dive to 5 feet then swim under water 15 yards, tread water one minute.

**P E 147. Beginning Tennis****1 Credit****P E 148. Beginning Racquetball****1 Credit****P E 150. Beginning Golf****1 Credit****P E 154. Personal Defense****1 Credit**

Physical conditioning and defense skills for men and women.

**P E 159. Introduction to Brazilian Jiu-Jitsu****1 Credit**

Brazilian Jiu-Jitsu is primarily a ground fighting art. This course will place heavy emphasis on positional strategy and focus on the sportive aspect of the sport. A Judo/Jiu-Jitsu Gi (uniform) is required.

**P E 166. Futsal (Five-A-Side Soccer)****1 Credit**

Futsal, official form of indoor soccer, approved by FIFA.

**P E 173. Running Fitness****1 Credit**

Basic fitness knowledge techniques and training methods of fitness running are practiced and refined.

**P E 199. Yoga****1 Credit**

A holistic approach to exercise benefiting the body, mind, and spirit. Practices focus on alignment, strength, breath relaxation, and restoration.

**P E 202. Intermediate Weight Training****1 Credit**

Intermediate training and skill techniques in weight lifting.

**Prerequisites:** P E 102 or consent of department head.

**P E 203. Weight Training for Olympic and Powerlifting****1 Credit**

Designed to teach the Olympic form-the clean, jerk and snatch. Class format is a preprogrammed style of instruction with preset programs. Emphasis placed on developing sound lifting techniques.

**Prerequisite(s):** P E 103 or consent of department head.

**P E 204. Cross Training****1 Credit**

Intensive training program that incorporates both aerobic and resistive overload approaches to training.

**P E 205. Walking Fitness****1 Credit**

Basic fitness knowledge techniques and training methods of fitness walking are practiced and refined.

**P E 206. Beginning Physical Fitness****1 Credit**

Progressive exposure to steady state exercise tailored to individual needs for the purpose of determining, improving, and maintaining physical fitness.

**P E 209. Intermediate Pilates****1 Credit**

Intermediate training and skill techniques in Pilates.

**Prerequisite(s):** PE 109 or consent of instructor.

**P E 212. Intermediate Volleyball-Men****1 Credit**

**Prerequisite:** P E 112 or consent of department head.

**P E 213. Intermediate Volleyball-Women****1 Credit**

**Prerequisite:** P E 113 or consent of department head.

**P E 215. Intermediate Walking****1 Credit**

A continuation of basic fitness knowledge techniques and training methods of fitness walking are practiced and refined.

**Prerequisite:** P E 205 or consent of department head.

**P E 216. Advanced Walking****1 Credit**

Advanced walking fitness and training techniques are presented, practiced, and refined.

**P E 228. Intermediate Aerobic Dance****1 Credit**

Aerobic dance at a high intensity level with a more in-depth study of the body's physiological response to exercise.

**Prerequisite:** P E 128 or consent of department head.

**P E 229. Intermediate Step Aerobics****1 Credit**

Step aerobic dance at a high intensity level with a more in-depth study of the body's physiological response to exercise.

**Prerequisite:** PE 129 or consent of department head.

**P E 230. Advanced Swimming****1 Credit**

Perfection of basic strokes, survival swimming, and physical fitness.

**Prerequisite(s):** P E 130 or ability to swim 100 yards.

**P E 263. Outdoor Recreation Skills****1 Credit**

Selected outdoor activities. Appropriate subtitles, such as hiking and backpacking, camping and survival, hunting and gun safety, casting and angling skills. May be repeated for maximum of 4 credits.

**P E 270. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Each offering will carry appropriate subtitle. May be repeated for a maximum of 4 credits.

**P E 299. Intermediate Yoga****1 Credit**

Intermediate training and skill techniques in Yoga.

**Prerequisite(s):** PE 199 or consent of instructor.

**PE P 185. Introduction and Foundations****3 Credits**

Historical and cultural foundations and vocational, scientific, and educational data on careers in health education, physical education, and recreation. Restricted to: Main campus only.

**PE P 208. Fitness for Health and Sport****3 Credits**

A study of the fitness needs for health enhancement and sport participation. Restricted to: P E, SP M, KIN, S ED majors.

**PE P 210. Theory and Technique of Aquatics****2 Credits**

Introduction to fundamental aquatics knowledge and skills.

**Prerequisite(s):** Ability to swim 100 yards.

**PE P 315. Elementary School Physical Education****3 Credits (2+2P)**

Methods for teaching physical education at the elementary level.

Primary focus on creating a learning environment for the acquisition and enhancement of developmentally appropriate locomotor, manipulative, and nonmanipulative skills. Field experience included. Consent of instructor required. Restricted to SED/PE P majors.

**Prerequisite(s):** GPA of 2.5.

**PE P 319. Lifetime Activities****2 Credits**

Knowledge and skills related to the lifetime activities of swimming, weight training, and other fitness promoting activities with emphasis on learning progressions.

**Prerequisite(s):** PE P 208.

**PE P 323. Racquet Sports****2 Credits**

Knowledge and skills related to the racquet sports of tennis, badminton, and pickleball with emphasis on developmental strategies and skill performance that influences pedagogical content knowledge. Administrative issues will be addressed.

**PE P 363. Theory and Technique of Lifelong Outdoor Leisure Activities****2 Credits**

Knowledge and skills related to lifelong outdoor leisure activities, including the examination of environmental science and awareness, kinesiology, and fundamental motor skills.

**PE P 392. Theory and Technique of Sports and Games****2 Credits**

Knowledge and skills related to team sports and games, with emphasis on developmental strategies and skill performance that influence pedagogical content knowledge. Administrative issues will also be addressed.

**PE P 393. Theory and Technique of Dance and Rhythms****2 Credits**

Knowledge and skills related to dance and rhythms, with emphasis on the analysis of dance elements and its role in physical education.

**PE P 394. Designing Student Centered Afterschool Physical Activity Clubs****3 Credits**

Knowledge, skills and field based practical application for creating student centered and student designed after school physical activity clubs.

**PE P 455. Adapted Physical Education****3 Credits**

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student.

**Prerequisite:** junior or senior standing.

**PE P 465. Senior Seminar****3 Credits**

Capstone course for physical education. Graded S/U.

**Prerequisite:** senior standing.

**PE P 466. Methods of Teaching Secondary Physical Education****6 Credits**

Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of instructor required.

**Prerequisite(s):** PE P 315 and admittance to TEP required.

**PE P 499. Problems****1-3 Credits (1-3)**

Problems in physical education and recreation and independent work in their solutions. A maximum of 3 credits during any one semester. May be repeated up to 6 credits. Consent of Instructor required.

**PE P 501. Special Topics****1-3 Credits (1-3)**

Offered under various subtitles that indicate the subject matter. May be repeated for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

**PE P 515. Advanced Athletic Training Education****3 Credits**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. Consent of Instructor required.

**PE P 550. Advanced Topics in Physical Education****1-4 Credits**

Advanced study in teaching processes, perceptual motor development, bioenergetics, biomechanical instrumentation, psychological bases of performance, or motor control.

**PE P 551. Sociology of Sports****3 Credits****PE P 555. Adapted Physical Education****3 Credits**

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student. Same as PE P 455 with additional requirements for graduate credit.

**Prerequisite:** consent of instructor.

**PE P 557. Adapted Physical Education : A Practitioner's Approach****3 Credits**

Preparation for qualified physical education professionals to teach individuals with disabilities motor and fitness skills. Knowledge of the Adapted Physical Education National Standards is developed so students may become nationally certified in the field. The inclusion of disability sports into general physical education curriculum is also major emphasis of this course. Consent of Instructor required.

**PE P 624. The Social Construction of the Body****3 Credits**

This course will explore how people's health and physical activity experiences and choices are often shaped by cultural narratives and expectations of the male and female body. Designed for graduate students in allied health and physical activity professions

## Sports Medicine

**SP M 190. Introduction to Athletic Training****3 Credits**

Introduction to the principles of athletic training.

**SP M 191. Medical Terminology****3 Credits**

Study of the structure of medical language with emphasis on sports medicine-related terminology. To include analysis and interpretation of medical documentation. Restricted to: Las Cruces campus only.

**SP M 200. Career Preparation****1 Credit**

From concept to implementation: Career exploration, setting up degree plans, finding graduate programs, developing professional resumes, writing letters of application, seeking letters of recommendation, and interview preparation May be repeated up to 3 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**SP M 223. Exploring Extreme Human Performance****3 Credits**

A reading, writing and documentary based course studying human's quest and the related sacrifices associated with participating in extreme performance activities such as the Olympics, wakeboarding, snowboarding, military special forces, ultra-run events, marathons, etc. Consent of Instructor required. Restricted to Las Cruces campus only.

**SP M 250. Emergency Response in Sports Medicine****2 Credits**

Designed to provide knowledge and experience in emergency care procedures, blood borne pathogens, and first aid. Students will receive certification in CPR/AED for the Professional Rescuer and in First Aid, upon successful completion of course. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of Instructor.

**SP M 271. Anatomy & Physiology I****3 Credits**

Detailed study of the structure and function of the human musculoskeletal, cardiovascular, respiratory, and peripheral nervous systems. Designed specifically for students interested in allied health professions. Restricted to Las Cruces campus only.

**SP M 271 L. Anatomy and Physiology Laboratory****1 Credit**

Compliment to SP M 271. Students will engage in activities designed to enhance appreciation of the anatomical structures related to the content areas for SP M 271. Restricted to Las Cruces campus only.

**SP M 272. Clinical Practicum I****2 Credits**

Introduction to the clinical aspects of the athletic training education program. Must maintain at least 3.0 GPA. May be repeated up to 4 credits. Consent of Instructor required. Restricted to: SP M majors. Restricted to Las Cruces campus only.

**SP M 273. Clinical Practicum II****3 Credits**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors. Restricted to Las Cruces campus only.

**SP M 275 L. A & P Lab PE/Dance****1 Credit**

Practical laboratory involving the kinematic and kinesthetic aspects of Human Anatomy and Physiology as it applied to Physical Education and Dance Restricted to: Physical Education and Dance. Not acceptable for Kinesiology Majors majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** SP M 271.

**SP M 290. General Medical Conditions****3 Credits**

Study of the recognition, evaluation, management, and treatment of non-orthopedic medical conditions that affect the physically active population. Consent of Instructor required. Restricted to: SP M and Kinesiology majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** SP M 190, 191 and 271/271L.

**SP M 303. Health and Exercise Psychology****3 Credits**

The course examines the reciprocal relationship among physical activity, exercise behavior, and psychological determinants associated with adopting and maintaining an exercise program. Topics include theories of behavioral change, exercise psychology interventions, the benefits/pitfalls of exercise, and psychological factors influencing patient rehabilitation.

**Prerequisite(s):** GPA of 2.75.

**SP M 304. Psychology of Sport****3 Credits**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles.

**Prerequisite(s):** GPA of 2.75.

**SP M 305. Applied Biomechanics****3 Credits**

The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement.

**Prerequisite(s):** SP M 271 GPA of 2.75.

**SP M 305 L. Applied Biomechanics Laboratory****1 Credit**

This course serves to provide an introduction to human movement and its analysis. The conceptual framework of the course will allow for the application of anatomical, mechanical, and electrical concepts in order to better understand the fundamental nature of movement.

**Prerequisite(s):** SP M 271; GPA 2.75.

**SP M 307. Pathophysiology and Human Function(s)****3 Credits**

Students will discuss basic concepts of pathophysiology such as inflammation & repair, infectious diseases, neoplasms, and diseases of specific physiological systems. In addition, students will discuss a variety of case studies, and in so doing will be able to relate pathophysiological conditions to symptoms, activity restrictions and disability.

**Prerequisite(s):** SP M 271; SP M 271L; SP M 308, GPA 2.75.

**SP M 308. Exercise Physiology****3 Credits (2+2P)**

Basic physiological principles as they apply to exercise and fitness programs. Laboratory experiences included. GPA of 2.75.

**Prerequisite(s):** SP M 271 or PE P 208.

**SP M 309. Neurophysiology and Human Function****3 Credits**

Students will discuss neurological control of human movement. Topics will include central and peripheral nervous system functions, with particular emphasis given to somatosensory afferent and motor efferent control. In addition, students will develop an understanding of the techniques employed to assess neurologic function in various patient populations.

**Prerequisite(s):** SP M 271; SP M 271L; SP M 308; and GPA of 2.75.

**SP M 310. Orthopedic Examination, Evaluation and Diagnosis of Lower Extremity Injuries****4 Credits**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatomy following athletic injury to the lower extremity. Must maintain at least 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 319. Lifetime Activities****2 Credits**

Knowledge and skills with weight training, cardiovascular exercise, Tai Chi, Pilates, and other lifetime activities related to the promotion of health/fitness through a lifespan.

**SP M 320 L. Palpation and Anatomical Kinesiology Laboratory****2 Credits**

Practical hands-on clinical laboratory introducing techniques necessary for physiological and functional kinematic evaluation of human function. May be repeated up to 2 credits.

**Prerequisite(s):** SP M 271, SP M 271L, GPA 2.75.

**SP M 324. Introduction to Exercise Science: Exercise Physiology and Biomechanics****3 Credits**

This course serves to provide a broad introduction to both the physiology of exercise and the mechanics of human movement. The conceptual framework of the course will allow for the development of a broad knowledge base regarding these concepts and the latter portions of the course will focus on real world application of the concepts. Consent of Instructor required.

**Prerequisite(s):** SP M 271 Anatomy and Physiology I.

**SP M 330. Exercise Testing and Prescription****4 Credits**

This combined lecture and lab class introduces students to the scientific basis for and principles of exercise testing and prescription. The focus is on basic approaches to exercise testing and prescription for healthy adults, while application to some special populations with chronic disease will be discussed. GPA of 2.75.

**Prerequisite(s):** SP M 271 and SP M 308 or consent of instructor.

**SP M 341. Motor Development****3 Credits**

Covers development of motor skills from infancy through maturity. Focus on the principles of motor development, early motor behavior, stage theory, and assessment. Field experiences will augment lecture and readings. May be repeated up to 3 credits. Consent of Instructor required.

**SP M 342. Motor Learning****3 Credits**

An examination of the theoretical foundations and related literature that underline the learning, performing, and retention of motor skills with implications for effective teaching and coaching. May be repeated up to 3 credits.

**Prerequisite(s):** GPA of 2.5.

**SP M 371. Anatomy and Physiology II****3 Credits**

Detailed study of the structure and function of the human endocrine, immune, digestive, reproductive, integumentary, central nervous and renal systems. Designed specifically for students interested in allied health professions. GPA of 2.75.

**Prerequisite(s):** SP M 271G or consent of instructor.

**SP M 371 L. Anatomy and Physiology II Lab****1 Credit**

The students will develop skills in palpating various bony landmarks as well as origins and insertions of major soft tissues. In addition, problem based learning scenarios will be used to complement the SP M 371 lecture material and thereby further students understanding of certain physiologic systems including neural, digestive, reproductive, endocrine, and integumentary.

**Prerequisite(s):** SP M 271; SPM 271 L; GPA 2.75.

**SP M 372. Clinical Practicum III****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 373. Clinical Practicum IV****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors.

**SP M 375. Therapeutic Modalities****4 Credits**

The physiological effects, indications, contraindication, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. May be repeated up to 4 credits. Consent of Instructor required. Must maintain 2.75 GPA. Restricted to: SP M, KIN majors.

**Prerequisite(s):** Consent of Instructor, SP M 271.

**SP M 409. Clinical Biomechanics****3 Credits**

The application of biomechanical analysis of human movement as it relates to clinical proficiencies through the use of anatomical, mechanical and electrical concepts.

**Prerequisite(s):** SPM 271, GPA 3.0.

**Corequisite(s):** SP M 409 L.

**SP M 409 L. Clinical Biomechanics Laboratory****1 Credit**

Laboratory experiments and biomechanical analysis of human movement as they relate to clinical proficiencies through the use of anatomical, mechanical and electrical concepts.

**Prerequisite(s):** SP M 271, SP M 409, GPA 3.0.

**Corequisite(s):** SP M 409.

**SP M 410. Orthopedic Examination, Evaluation and Diagnosis of Upper Extremity Injuries****4 Credits**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatom following athletic injury to the upper extremity. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 411. Pharmacology in Athletic Training****2 Credits**

An introduction to general medical conditions and pharmacological applications in the athletic training setting. Emphasis on the laws governing the development and distribution, indications, contraindications, precautions, and interactions of prescription and over-the-counter medications. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 412. Inferential Statistics in Sport and Exercise Science****3 Credits**

Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course Restricted to: KIN, SP M majors.

**Prerequisite(s):** GPA of 2.75; or consent of instructor.

**SP M 413. Statistical Application in Sports and Exercise Science****3 Credits**

An introduction to descriptive statistics and the interpretation of data in the solution of problems in sport and exercise related research. GPA 2.75.

**Prerequisite(s):** Junior or senior standing.

**SP M 415. Therapeutic Exercise****3 Credits**

The physiological effects, indications, contraindications, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 420. Orthopedic Examination, Evaluation and Diagnosis of Core, Spine and Head Injuries****3 Credits**

Advanced clinical assessment techniques and applications. Must maintain at least a 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors.

**SP M 422. Clinical Practicum V****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: ATEP, SP M majors.

**SP M 423. Clinical Practicum VI****3 Credits**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students might complete a general medical rotation with this course Consent of Instructor required. Restricted to: SP M majors.

**SP M 424. Clinical Practicum VII****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students might complete a general medical rotation with this course. Must maintain 2.8 GPA. Consent of Instructor required. Restricted to: ATEP, SP M majors.

**SP M 425. Organization and Administration in Athletic Training****3 Credits**

An introduction to management, leadership, financial strategies, professional development and legal issues related to the athletic training setting. Must maintain 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors.

**SP M 445. Internship****6,12 Credits (6,12P)**

A full-time internship in an approved wellness, fitness, athletic or recreation program with experience in all phases of management and operation. Field instructor supervision. This internship may require relocation to a site outside of the Las Cruces area. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: Kinesiology Majors majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Senior standing, GPA of 2.75, completion of all major courses.

**SP M 451. Advanced Exercise Physiology****3 Credits**

Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences. GPA of 2.75.

**Prerequisite(s):** SP M 271 and SP M 308 or consent of instructor.

**SP M 456. Exercise for Special Populations****3 Credits**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions.

**Prerequisite(s):** SP M 308 and SP M 330; GPA of 2.75.

**SP M 458. Physical Dimensions of Aging****3 Credits**

This course introduces students to physical, physiological, social, mental, and emotional aspects of human aging. Age-related changes in human function are discussed the context of applied healthcare settings, and the implications for appropriate physical activity and functional independence. GPA of 2.75.

**Prerequisite(s):** SP M 308.

**SP M 460. Principles of Strength and Conditioning****3 Credits**

Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. GPA of 2.75.

**Prerequisite(s):** SP M 308.

**SP M 460 L. Principles of Strength and Conditioning Laboratory****1 Credit**

An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors. GPA of 2.75.

**Prerequisite(s):** SP M 308.

**SP M 465. Ethics and Legal Issues in Athletic Training****3 Credits**

Examination of the legal and ethical issues associated with the practice of athletic training and other health care fields. Must maintain a 3.0 GPA. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: SP M majors.

**SP M 498. Advanced Athletic Training I****1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainer's Association Education Council. Consent of Instructor required.

**SP M 499. Problems****1-3 Credits**

Problems in athletic training and independent work in their solutions. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Junior or Senior status; Consent of ATEP director.

**SP M 504. Psychology of Sport****3 Credits**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles. Same as SP M 304 with additional requirements for graduate credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**SP M 508. Applied Biomechanics****3 Credits**

The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement. Same as SP M 305 with additional requirements for graduate credits Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**SP M 509. Clinical Biomechanics****3 Credits**

The application biomechanical analysis of human movement as it relates to clinical proficiencies through the use of anatomical, mechanical and electrical concepts. Same as SP M 409 with additional requirements for graduate credits Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**SP M 510. Graduate Athletic Training Seminar I****1-3 Credits (1-3)**

Advanced seminar topics in athletic training. Students will explore generalized topics within the field of athletic training under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program. Students may engage in teaching and research opportunities in unique areas. Students may explore athletic training topics within the classroom or independently through designated resources Consent of Instructor required.

**SP M 511. Graduate Athletic Training I****1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Students will examine topics in athletic training in conjunction with faculty members within the Commission on the Accreditation of Athletic Training Education (CAATE) Athletic Training Program at New Mexico State University . Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. Consent of Instructor required.

**SP M 512. Inferential Statistics in Sports and Exercise Science****3 Credits**

Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course. Same as SP M 412 with additional requirements for graduate credit Consent of Instructor required.

**Prerequisite(s):** Consent of Instructor.

**SP M 513. Graduate Athletic Training Seminar II****1-3 Credits (1-3)**

Advanced seminar topics in athletic training. Students will explore more specialized topics within the field of athletic training under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program. Students should be prepared to further explore topics previously covered in SP M 512 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas. Students may explore athletic training topics within the classroom or independently through designated resources. Consent of Instructor required.

**SP M 514. Graduate Athletic Training Research I****1-3 Credits (1-3)**

Advanced research topics in athletic training. Students will explore research and evidence based practices within the field of athletic training. Students will work under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program faculty member. Students should be prepared to further explore research topics within a specific discipline with the intent of disseminating and sharing information with the athletic training community. topics previously covered in SP M 512 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas Consent of Instructor required.

**SP M 515. Graduate Athletic Training II****3 Credits**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. Consent of Instructor required.

**SP M 545. Skill Acquisition and Performance****3 Credits**

Behavioral and physiological examination factors that influence the acquisition and performance of motor skills. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: SP M 342.

**SP M 551. Advanced Exercise Physiology****3 Credits**

Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Consent of Instructor required.

**SP M 556. Exercise for Special Populations****3 Credits**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Taught with PE P 456 with additional work required at the graduate level. Consent of Instructor required.

**SP M 558. Physical Dimensions of Aging****3 Credits**

This course introduces graduate students to physical, physiological, social, mental, and emotional aspects of human aging. Age-related changes in human function are discussed in the context of applied healthcare settings, and the implications for appropriate physical activity and functional independence. Graduate students in this course are expected to participate in organizing and leading some of the class discussions and assisting in the identification of appropriate materials for the course. Consent of Instructor required.

**SP M 560. Principles of Strength and Conditioning****3 Credits**

Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Consent of Instructor required.

**SP M 597. Project****1-12 Credits (1-12)**

Selected projects for doctoral students. May be repeated up to 12 credits. Consent of Instructor required.

**SP M 600. Kinesiology Research****1-3 Credits (1-3)**

Research to be conducted under the direction of a Kinesiology faculty member May be repeated up to 15 credits. Consent of Instructor required.

**SP M 608. Cardiovascular Physiology****3 Credits**

This graduate level course provides an in-depth study of cardiovascular structure and function. The course assumes that students have a strong background in human physiology. Topics include, but are not limited to: cellular structure of the heart and vascular system; cardiac function, including electrophysiology of the heart; vascular function; neurohumoral control of the heart and circulation, organ blood flow, exchange function of the microcirculation; the impact of common cardiovascular diseases on cardiovascular structure and function, and cardiovascular adaptations to chronic exercise.

**SP M 660. Designing Resistance Training Program****3 Credits**

Detailed study of the physiological concepts associated with designing resistance-training programs for children, women, seniors, athletic performance and rehabilitation.

**SP M 665. Skeletal Muscle: Structure and Function****3 Credits**

Basic muscle morphology and physiology with molecular and cellular adaptations in skeletal muscle as consequences to varying exercise regimens

**SP M 700. Doctoral Dissertation****1-18 Credits (1-18)**

Doctoral Dissertation hours to be conducted under the direction of a Kinesiology Faculty. May be repeated up to 18 credits. Consent of Instructor required. Thesis/Dissertation Grading.

**Name:** TBA, Academic Department Head

**Name:** Maggie Karveller, Department Secretary

**Office Location:** Activity Center Room 204

**Phone:** (575) 646-2216

**Website:** <https://kind.nmsu.edu/kin/>

## Athletic Training - Bachelor of Science in Athletic Training

The New Mexico State University (NMSU) Athletic Training Bachelors Degree Program is accredited by the Commission on Accreditation of Athletic Training Education (CAATE), and has a competitive application

process. The program provides a challenging didactic and comprehensive clinical educational experience, as well as, incorporates the values of a supportive academic and clinical community in order to prepare future leaders in athletic training.

Students who complete the degree requirements earn a Bachelor of Science in Athletic Training and are eligible to sit for the Board of Certification (BOC) examination. Students who pass the BOC exam are referred to as Certified Athletic Trainers (AT).

Please see the program webpage, <https://kind.nmsu.edu/training/>, for up-to-date information concerning all aspects of the Athletic Training Program (ATP).

## Application Procedures for Traditional Undergraduate Students

A limited number of applicants will be admitted to the professional phase of the Athletic Training major. **A maximum of 20 students will be admitted to the program each year.** Application to the Athletic Training Program takes place during the spring semester. A second round of admissions may occur in the summer for students completing pre-requisite coursework during one of the summer terms if space is available. Interested students must meet with the Program Director prior to applying for admissions to the ATP.

Application to the Athletic Training Program requires:

1. A cumulative GPA of 2.75 or higher
2. A prerequisite GPA of 3.00 or higher
3. The following courses have specific grade requirements and are used to calculate the prerequisite GPA
  - a. SP M 190 Introduction to Athletic Training with a grade of B or better
  - b. SP M 271 Anatomy & Physiology I with a grade of C- or better
  - c. SP M 272 Clinical Practicum I with a grade of B or better
4. The following courses need to be in progress or completed at the time your application is submitted:
 

ENGL 111G	Rhetoric and Composition	4
MATH 121G	College Algebra	3
MATH 142G	Calculus for the Biological and Management Sciences	3
MATH 190G	Trigonometry and Precalculus	4
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
5. Submission of the following:
  - a. Program application form
  - b. Professional resume
  - c. An unofficial NMSU transcript
  - d. Submission of official transcripts of any college courses taken at a college/university other than NMSU.
  - e. Proof of current Emergency Cardiac Care (ECC) certification.
  - f. Three letters of recommendation.
  - g. Copy of physical examination completed by a licensed healthcare professional (MD/DO/PA/NP).
  - h. Copy of vaccination verification showing completion of the following:<sup>1</sup>

- i MMR (2 doses administered 4-8 week apart or serologic test positive for MMR antibody)
- ii Varicella (2 doses administered 4-8 weeks apart or serologic test positive for Varicella antibody)
- iii Tetanus-Diphtheria-Pertussis (Tdap) 1 dose within the past 10 years
- iv Hepatitis B. (3 doses administered over a period of 4-6 months)
- v Annual TB screening

- <sup>1</sup> Applicants that cannot provide proof of vaccination due to religious or conscientious objection to vaccinations must meet with the Program Director.
1. A signed copy of the programs technical standards for admission form.
  2. 500 word minimum essay addressing the question “Why athletic training is the correct major and career path for you”.
  3. Completion of 60 hours of clinical observation under the supervision of an Athletic Trainer.

## Transfer Student Policy

Transfer students who meet the Application Requirements may be considered for admission into the Athletic Training Program provided there is space available. The admission of transfer students will include a careful evaluation of the student’s cumulative GPA and prerequisite coursework. The Program Director will make all decisions related to the acceptance of transfer courses required for the major. Transfer students should contact the Program Director regarding program requirements and any questions regarding transfer courses. Please see the program webpage, <https://kind.nmsu.edu/training/transfer/>, for a complete description of the AT program transfer policy.

## Degree Requirements

### GENERAL EDUCATION REQUIRMENTS

<i>Area I: English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition	4
Choose one from the following (218G or 318G preferred)		
ENGL 203G	Business and Professional Communication	3
or ENGL 211G	Writing in the Humanities and Social Sciences	
or ENGL 218G	Technical and Scientific Communication	
or ENGL 311G	Advanced Composition	
or ENGL 318G	Advanced Technical and Professional Communication	
Choose one of the following:		
COMM 253G	Public Speaking	3
or COMM 265G	Principles of Human Communication	
or AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II: Mathematics</i>		
Choose one from the following:		
MATH 121G	College Algebra	3
or MATH 142G	Calculus for the Biological and Management Sciences	
or MATH 190G	Trigonometry and Precalculus	

or MATH 191G	Calculus and Analytic Geometry I		HIST 111G	Global History to 1500	
or MATH 291G	Calculus and Analytic Geometry III		HIST 112G	Global History Since 1500	
<i>Area III: Laboratory Sciences</i>					
BIOL 111G	Natural History of Life	3	HIST 201G	Introduction to Early American History	
or BIOL 211G	Cellular and Organismal Biology		HIST 202G	Introduction to Recent American History	
BIOL 111GL	Natural History of Life Laboratory (BIOL 211G, 211L preferred))	1	HIST 211G	East Asia to 1600	
or BIOL 211GL	Cellular and Organismal Biology Laboratory		HIST 212G	East Asia since 1600	
CHEM 110G	Principles and Applications of Chemistry (CHEM 110G, CHEM 111G preferred))	4	HIST 221G	Islamic Civilizations to 1800	
or CHEM 111G	General Chemistry I		HIST 222G	Islamic Civilizations since 1800	
or CHEM 112G	General Chemistry II		MUS 101G	An Introduction to Music	
or PHYS 211G	General Physics I		MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
or PHYS 211GL	General Physics I Laboratory		PHIL 100G	Philosophy, Law and Ethics	
<i>Area IV: Social/Behavioral Sciences</i>					
PSY 201G	Introduction to Psychology	3	PHIL 101G	The Art of Wondering	
Choose two of the following:		6	PHIL 124G	Philosophy of Music	
ANTH 120G	Human Ancestors		PHIL 136G	The Quest for God	
ANTH 125G	Introduction to World Cultures		PHIL 201G	Introduction to Philosophy	
ANTH 201G	Introduction to Anthropology		PHIL 211G	Informal Logic	
ANTH 202G	World Archaeology		PHIL 223G	Ethics	
ANTH 203G	Introduction to Language and Cultural Anthropology		THTR 101G	The World of Theatre	
C EP 110G	Human Growth and Behavior		<i>Viewing the Wider World (6 credits from two different colleges)</i> 6		
ECON 201G	Introduction to Economics		<b>Athletic Training Courses</b>		
ECON 251G	Principles of Macroeconomics		HNDS 251	Human Nutrition	3
ECON 252G	Principles of Microeconomics		SP M 190	Introduction to Athletic Training	3
GEOG 112G	World Regional Geography		SP M 250	Emergency Response in Sports Medicine	2
GEOG 120G	Culture and Environment		SP M 271	Anatomy & Physiology I	3
GOVT 100G	American National Government		SP M 271 L	Anatomy and Physiology Laboratory	1
GOVT 110G	Introduction to Political Science		SP M 272	Clinical Practicum I <sup>2</sup>	2
GOVT 150G	American Political Issues		SP M 273	Clinical Practicum II	3
GOVT 160G	International Political Issues		SP M 305	Applied Biomechanics	3
JOUR 105G	Media and Society		SP M 307	Pathophysiology and Human Function(s)	3
LING 200G	Introduction to Language		SP M 308	Exercise Physiology	3
PHLS 150G	Personal Health and Wellness		SP M 310	Orthopedic Examination, Evaluation and Diagnosis of Lower Extremity Injuries	4
SOC 101G	Introductory Sociology		SP M 371	Anatomy and Physiology II	3
SOC 201G	Contemporary Social Problems		SP M 371 L	Anatomy and Physiology II Lab	1
S WK 221G	Introduction to Social Welfare		SP M 372	Clinical Practicum III	3
W S 201G	Introduction to Women s Studies		SP M 373	Clinical Practicum IV	3
W S 202G	Representing Women Across Cultures		SP M 375	Therapeutic Modalities	4
<i>Area V: Humanities and Fine Arts</i>					
Choose any two of the following:		6	SP M 410	Orthopedic Examination, Evaluation and Diagnosis of Upper Extremity Injuries	4
ART 101G	Orientation in Art		SP M 411	Pharmacology in Athletic Training	2
ART 110G	Visual Concepts		SP M 415	Therapeutic Exercise	3
DANC 101G	Dance Appreciation		SP M 420	Orthopedic Examination, Evaluation and Diagnosis of Core, Spine and Head Injuries	3
ENGL 115G	Perspectives on Literature		SP M 422	Clinical Practicum V	3
ENGL 116G	Perspectives on Film		SP M 423	Clinical Practicum VI	3
ENGL 220G	Introduction to Creative Writing		SP M 424	Clinical Practicum VII	3
ENGL 244G	Literature and Culture		SP M 425	Organization and Administration in Athletic Training	3
HIST 101G	Roots of Modern Europe		Select 3 credits from the following 3		
HIST 102G	Modern Europe		SP M 498	Advanced Athletic Training I	
HIST 110G	Making History		SP M 499	Problems	

<b>Statistics Requirement</b>	
Select 3 credits from the following	3
STAT 251G	Statistics for Business and the Behavioral Sciences
STAT 271G	Statistics for Psychological Sciences
A ST 311	Statistical Applications
SP M 412	Inferential Statistics in Sport and Exercise Science
<b>Athletic Training Electives</b>	
Select a minimum of 4 credits from the following or approved by the AT Program Director:	4
SP M 303	Health and Exercise Psychology
SP M 304	Psychology of Sport
SP M 309	Neurophysiology and Human Function
SP M 320 L	Palpation and Anatomical Kinesiology Laboratory
SP M 330	Exercise Testing and Prescription
SP M 341	Motor Development
SP M 342	Motor Learning
SP M 409	Clinical Biomechanics
SP M 409 L	Clinical Biomechanics Laboratory
SP M 451	Advanced Exercise Physiology
SP M 456	Exercise for Special Populations
SP M 458	Physical Dimensions of Aging
SP M 460	Principles of Strength and Conditioning
SP M 460 L	Principles of Strength and Conditioning Laboratory
SP M 465	Ethics and Legal Issues in Athletic Training
<b>Total Credits</b>	<b>120</b>

<sup>2</sup> Students interested in majoring in Athletic Training are encouraged to meet with the Athletic Training Academic Advisor prior to enrolling in SP M 272 Clinical Practicum I.

## Dance - Bachelor of Arts in Dance

The Bachelor of Arts (BA) in Dance provides three concentration areas in which to pursue a dance degree. Undergraduate students can choose to focus their studies in Contemporary Dance, DanceSport or Spanish Dance. All students are required to take core dance courses as well as courses from their concentration area. This provides a variety of cross training that will benefit all dancers to be well rounded professional dancers, competitors and teachers. The B.A. also provides students with an appropriate background for the pursuit of advanced degrees in teaching, performance, choreography and other related fields. ENGL 111G Rhetoric and Composition, Area II Mathematics, Core Courses and Dance Concentration Courses require a grade of C- or better. The College of Education requires a minimum GPA of 2.5 for graduation.

## Degree Requirements

### GENERAL EDUCATION REQUIREMENTS

<i>Area I English and Communication Arts</i>	
ENGL 111G	Rhetoric and Composition
Choose one of the following	3

ENGL 203G	Business and Professional Communication
ENGL 211G	Writing in the Humanities and Social Sciences
ENGL 218G	Technical and Scientific Communication
ENGL 311G	Advanced Composition
ENGL 318G	Advanced Technical and Professional Communication

Choose one of the following	3
COMM 253G	Public Speaking
or COMM 265G	Principles of Human Communication
HON 265G	Principles of Human Communication Honors
AXED 201G	Effective Leadership and Communication in Agricultural Organizations

<i>Area II Mathematics</i>	
Choose one of the following	3
MATH 121G	College Algebra
MATH 142G	Calculus for the Biological and Management Sciences
MATH 190G	Trigonometry and Precalculus
MATH 210G	Mathematics Appreciation

<i>Area III Laboratory Sciences</i>	
Choose two of the following	8
ASTR 105G	The Planets
or ASTR 110G	Introduction to Astronomy
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory
BIOL 110G	Contemporary Problems in Biology
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory

CHEM 110G	Principles and Applications of Chemistry
CHEM 111G	General Chemistry I
CHEM 112G	General Chemistry II
E S 110G	Introductory Environmental Science
PHYS 110G	The Great Ideas of Physics
PHYS 120G	Introduction to Acoustics
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory

<i>Area IV Social/Behavioral Sciences</i>	
Choose two of the following	6
C EP 110G	Human Growth and Behavior
ANTH 120G	Human Ancestors
ANTH 125G	Introduction to World Cultures
ANTH 201G	Introduction to Anthropology
ANTH 203G	Introduction to Language and Cultural Anthropology
ECON 201G	Introduction to Economics
ECON 251G	Principles of Macroeconomics

ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
PHLS 150G	Personal Health and Wellness	
PSY 201G	Introduction to Psychology	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
W S 201G	Introduction to Women s Studies	
<i>Area V Humanities and Fine Arts</i>		
DANC 101G	Dance Appreciation	3
Choose two of the following		6
ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
THTR 101G	The World of Theatre	
<i>Viewing the Wider World (6 credits from two different colleges; DANC 451V and HON 347V cannot be taken for VWW)</i>		6
<b>Dance Core Courses</b>		
Select 9 credits of technique classes outside the area of concentration		9
Select 17 credits from the following:		17
DANC 151	Master Works	
DANC 200	Dance Pedagogy: Educational Theory	
DANC 203	Dance Production I	
DANC 275	Dance Studio Management	
DANC 280	Improvisation I	
DANC 303	Dance Production II	
DANC 451V	World Dance	
DANC 465	Senior Culminating Experience	
SP M 271	Anatomy & Physiology I	
SP M 271 L	Anatomy and Physiology Laboratory	
<i>Concentration Courses (see required courses below)</i>		52
Total Credits		120

## Concentration: Contemporary Dance

Contemporary Dance is the study of ballet, modern, jazz, and tap dance. Students are trained in dance technique, dance education (teaching) and dance production. This concentration prepares dancers for a professional performance and/or teaching career.

### Requirements

Select 52 credits from the following:		52
DANC 127	Tap Dance I	
DANC 202	Dance Ensemble	
DANC 205	Contemporary Dance Ensemble I	
DANC 212	Intermediate Hip-Hop Dance	
DANC 223	Ballet Technique II	
DANC 224	Jazz Technique II	

DANC 226	Modern Dance Technique II	
DANC 227	Tap Dance II	
DANC 289	Principles of Choreography I	
DANC 300	Dance Pedagogy: Creative Movement	
DANC 305	Contemporary Dance Ensemble II	
DANC 323	Ballet Technique III	
DANC 324	Jazz Technique III	
DANC 326	Modern Dance III	
DANC 365	Dance Pedagogy: Dance in Education	
DANC 380	Improvisation II	
DANC 389	Principles of Choreography II	
DANC 413	Dance Practicum II	
DANC 423	Ballet Technique IV	
DANC 424	Jazz Dance Technique IV	
DANC 426	Modern Dance Technique IV	
DANC 466	Dance Pedagogy: Dance Technique	
Total Credits		52

## Concentration: DanceSport

DanceSport is the study of Ballroom, Latin, Swing and Night Club dance. Students are trained in dance technique, dance education (teaching) and dance production. This concentration prepares dancers for a professional performance, competition and/or teaching career.

### Requirements

Select 52 credits from the following:		52
DANC 204	Dance Sport I	
DANC 209	Argentine Tango II	
DANC 218	West Coast Swing II	
DANC 221	Country Western Dance	
DANC 222	Bronze American Rhythm	
DANC 225	Bronze American Smooth	
DANC 232	Bronze International Latin	
DANC 235	Bronze International Standard	
DANC 269	DanceSport Choreography I	
DANC 304	Dance Sport II	
DANC 322	Silver American Rhythm	
DANC 325	Silver American Smooth	
DANC 332	Silver International Latin	
DANC 335	Silver International Standard	
DANC 342	DanceSport Pedagogy: Rhythm	
DANC 345	DanceSport Pedagogy: Smooth	
DANC 369	DanceSport Choreography II	
DANC 412	DanceSport Practicum	
DANC 422	Gold American Rhythm	
DANC 425	Gold American Smooth	
DANC 432	Gold International Latin	
DANC 435	Gold International Standard	
DANC 442	DanceSport Pedagogy: Latin	
DANC 445	DanceSport Pedagogy: Standard	
DANC 447	DanceSport Certification Preparation	
Total Credits		52

## Concentration: Spanish Dance

Spanish Dance is the study of Flamenco and Classical Spanish dance. Students are trained in dance technique, dance education (teaching) and dance production. This concentration prepares dancers for a professional performance and/or teaching career.

### Requirements

Select 52 credits from the following:	52
DANC 206	Spanish Dance Ensembles I
DANC 210	Classical Spanish II
DANC 223	Ballet Technique II
DANC 226	Modern Dance Technique II
DANC 229	Flamenco II
DANC 279	Flamenco Choreography I
DANC 301	Flamenco Pedagogy I
DANC 306	Spanish Dance Ensemble II
DANC 310	Classical Spanish Dance III
DANC 329	Flamenco III
DANC 339	Flamenco Structure and Improvisation
DANC 379	Flamenco Choreography II
DANC 401	Flamenco Pedagogy II
DANC 411	Flamenco Practicum
DANC 462	Flamenco Dance History
Total Credits	52

## Kinesiology - Bachelor of Science in Kinesiology

The Bachelor of Science in Kinesiology degree program consists of 15 credit hours of core coursework, plus additional coursework in one of four concentration areas: Exercise Science, Clinical Exercise Science, Performance Psychology, or Physical Education. For the required number of concentration area credit hours see the program descriptions below. Regardless of the concentration, students are required to complete 120 total semester hours for the Kinesiology degree. Additionally, students pursuing a Kinesiology degree will be responsible to ensure that they complete 48 upper division credits (300 and 400 level courses). Kinesiology students must maintain a minimum 2.75 GPA in order to enroll in most upper division SP M and PE P courses. Some courses in the Clinical Exercise Science Concentration require a minimum cumulative GPA of 3.0. ENGL 111G, Area II courses, all Kinesiology Core courses, concentration courses, and approved electives must be completed with a grade of C- or better.

Successful completion of the Kinesiology degree will support a variety of careers in health sciences, biomedical research, and teaching. Information about Kinesiology and potential employment opportunities may be obtained at the Department of Kinesiology and Dance in the Activity Center 204, phone 646-2215.

## Concentration: Clinical Exercise Science

### Required Courses

<i>Area I: English and Communication Arts</i>	
ENGL 111G	Rhetoric and Composition 4
Choose one from the following (ENGL 218G or ENGL 318G are preferred):	3

ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II: Mathematics</i>		3
MATH 121G	College Algebra	
MATH 142G	Calculus for the Biological and Management Sciences	
MATH 190G	Trigonometry and Precalculus	
MATH 191G	Calculus and Analytic Geometry I	
MATH 192G	Calculus and Analytic Geometry II	
MATH 291G	Calculus and Analytic Geometry III	
<i>Area III: Laboratory Sciences</i>		8
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
<i>Area IV: Social/Behavioral Sciences</i>		9
PSY 201G	Introduction to Psychology	
Choose two from the following:		
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
C EP 110G	Human Growth and Behavior	
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
GOVT 160G	International Political Issues	
JOUR 105G	Media and Society	
LING 200G	Introduction to Language	

PHLS 150G	Personal Health and Wellness	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
S WK 221G	Introduction to Social Welfare	
W S 201G	Introduction to Women s Studies	
W S 202G	Representing Women Across Cultures	
<i>Area V: Humanities and Fine Arts</i>		6
ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
DANC 101G	Dance Appreciation	
ENGL 115G	Perspectives on Literature	
ENGL 116G	Perspectives on Film	
ENGL 220G	Introduction to Creative Writing	
ENGL 244G	Literature and Culture	
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 110G	Making History	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	
HIST 222G	Islamic Civilizations since 1800	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
PHIL 100G	Philosophy, Law and Ethics	
PHIL 101G	The Art of Wondering	
PHIL 124G	Philosophy of Music	
PHIL 136G	The Quest for God	
PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	
PHIL 223G	Ethics	
THTR 101G	The World of Theatre	
<i>Viewing a Wider World</i>		6
<b>Kinesiology Core Courses</b>		38
PE P 185	Introduction and Foundations	
PE P 208	Fitness for Health and Sport	
SP M 271	Anatomy & Physiology I	
SP M 271 L	Anatomy and Physiology Laboratory	
SP M 308	Exercise Physiology	
SP M 342	Motor Learning	
SP M 371	Anatomy and Physiology II	
SP M 371 L	Anatomy and Physiology II Lab	
SP M 445	Internship	
SP M 303	Health and Exercise Psychology	
or SP M 304	Psychology of Sport	
Choose one from the following:		
A ST 251G	Statistics for Business and the Behavioral Sciences	

or STAT 251G	Statistics for Business and the Behavioral Sciences	
A ST 311	Statistical Applications	
STAT 271G	Statistics for Psychological Sciences	
SP M 412	Inferential Statistics in Sport and Exercise Science	
<b>Concentration Courses</b>		19
SP M 320 L	Palpation and Anatomical Kinesiology Laboratory	
SP M 330	Exercise Testing and Prescription	
SP M 409	Clinical Biomechanics	
SP M 409 L	Clinical Biomechanics Laboratory	
SP M 456	Exercise for Special Populations	
Choose two from the following:		
SP M 307	Pathophysiology and Human Function(s)	
SP M 309	Neurophysiology and Human Function	
SP M 451	Advanced Exercise Physiology	
SP M 458	Physical Dimensions of Aging	
<i>Electives</i> <sup>1</sup>		21
<b>Total Credits</b>		120

<sup>1</sup> A list of approved electives can be found on the degree plans (<https://education.nmsu.edu/advising/noteachmaj>).

## Concentration: Exercise Science

### Required Courses

<i>Area I: English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition	4
Choose one from the following (ENGL 218G or ENGL 318G preferred):		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II: Mathematics</i>		3
MATH 121G	College Algebra	
MATH 142G	Calculus for the Biological and Management Sciences	
MATH 190G	Trigonometry and Precalculus	
MATH 191G	Calculus and Analytic Geometry I	
MATH 192G	Calculus and Analytic Geometry II	
MATH 291G	Calculus and Analytic Geometry III	
<i>Area III: Laboratory Science</i>		8
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	

BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
<b>Area IV: Social/Behavioral Sciences</b>		<b>9</b>
PSY 201G	Introduction to Psychology	
Select two courses from the following:		
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
C EP 110G	Human Growth and Behavior	
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
JOUR 105G	Media and Society	
LING 200G	Introduction to Language	
PHLS 150G	Personal Health and Wellness	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
S WK 221G	Introduction to Social Welfare	
W S 201G	Introduction to Women s Studies	
W S 202G	Representing Women Across Cultures	
<b>Area V: Humanities and Fine Arts</b>		<b>6</b>
ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
DANC 101G	Dance Appreciation	
ENGL 115G	Perspectives on Literature	
ENGL 116G	Perspectives on Film	
ENGL 220G	Introduction to Creative Writing	
ENGL 244G	Literature and Culture	
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 110G	Making History	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 221G	Islamic Civilizations to 1800	
HIST 222G	Islamic Civilizations since 1800	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	

PHIL 100G	Philosophy, Law and Ethics	
PHIL 101G	The Art of Wondering	
PHIL 124G	Philosophy of Music	
PHIL 136G	The Quest for God	
PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	
PHIL 223G	Ethics	
THTR 101G	The World of Theatre	

*Viewing a Wider World* 6

**Kinesiology Core** 38

PE P 185	Introduction and Foundations	
PE P 208	Fitness for Health and Sport	
SP M 271	Anatomy & Physiology I	
SP M 308	Exercise Physiology	
SP M 342	Motor Learning	
SP M 371 & 371 L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
SP M 445	Internship	

Choose one from the following:

SP M 303	Health and Exercise Psychology	
SP M 304	Psychology of Sport	

Choose one from the following:

A ST 251G	Statistics for Business and the Behavioral Sciences	
or STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
A ST 311	Statistical Applications	
SP M 412	Inferential Statistics in Sport and Exercise Science	

#### Concentration Courses

SP M 305	Applied Biomechanics	3
SP M 305 L	Applied Biomechanics Laboratory	1
SP M 330	Exercise Testing and Prescription	4
SP M 451	Advanced Exercise Physiology	3
SP M 456	Exercise for Special Populations	3
SP M 460	Principles of Strength and Conditioning	3
SP M 460 L	Principles of Strength and Conditioning Laboratory	1

*Electives*<sup>1</sup> 22

Total Credits 120

<sup>1</sup> A list of approved electives can be found on the degree plans (<https://education.nmsu.edu/advising/noteachmaj>).

## Concentration: Performance Psychology: Minor in Psychology

#### Required Courses

<i>Area I: English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition	4
Choose one from the following (ENGL 218G or ENGL 318G preferred):		
ENGL 203G	Business and Professional Communication	3

ENGL 211G	Writing in the Humanities and Social Sciences		SOC 201G	Contemporary Social Problems	
ENGL 218G	Technical and Scientific Communication		S WK 221G	Introduction to Social Welfare	
ENGL 311G	Advanced Composition		W S 201G	Introduction to Women s Studies	
ENGL 318G	Advanced Technical and Professional Communication		W S 202G	Representing Women Across Cultures	
Choose one from the following:		3	<i>Area V: Humanities and Fine Arts</i>		6
COMM 253G	Public Speaking		ART 101G	Orientation in Art	
COMM 265G	Principles of Human Communication		ART 110G	Visual Concepts	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations		DANC 101G	Dance Appreciation	
<i>Area II: Mathematics</i>		3	ENGL 115G	Perspectives on Literature	
MATH 121G	College Algebra		ENGL 116G	Perspectives on Film	
MATH 142G	Calculus for the Biological and Management Sciences		ENGL 220G	Introduction to Creative Writing	
MATH 190G	Trigonometry and Precalculus		ENGL 244G	Literature and Culture	
MATH 191G	Calculus and Analytic Geometry I		HIST 101G	Roots of Modern Europe	
MATH 192G	Calculus and Analytic Geometry II		HIST 102G	Modern Europe	
MATH 291G	Calculus and Analytic Geometry III		HIST 110G	Making History	
<i>Area III: Laboratory Sciences</i>		8	HIST 111G	Global History to 1500	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory		HIST 112G	Global History Since 1500	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory		HIST 201G	Introduction to Early American History	
CHEM 111G	General Chemistry I		HIST 202G	Introduction to Recent American History	
CHEM 112G	General Chemistry II		HIST 211G	East Asia to 1600	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory		HIST 212G	East Asia since 1600	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory		HIST 221G	Islamic Civilizations to 1800	
<i>Area IV: Social and Behavioral Sciences</i>		9	HIST 222G	Islamic Civilizations since 1800	
PSY 201G	Introduction to Psychology		MUS 101G	An Introduction to Music	
Choose two courses from the following:			MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
ANTH 120G	Human Ancestors		PHIL 100G	Philosophy, Law and Ethics	
ANTH 125G	Introduction to World Cultures		PHIL 101G	The Art of Wondering	
ANTH 201G	Introduction to Anthropology		PHIL 124G	Philosophy of Music	
ANTH 202G	World Archaeology		PHIL 136G	The Quest for God	
ANTH 203G	Introduction to Language and Cultural Anthropology		PHIL 201G	Introduction to Philosophy	
C EP 110G	Human Growth and Behavior		PHIL 211G	Informal Logic	
ECON 201G	Introduction to Economics		PHIL 223G	Ethics	
ECON 251G	Principles of Macroeconomics		THTR 101G	The World of Theatre	
ECON 252G	Principles of Microeconomics		<i>Viewing a Wider World</i>		6
GEOG 112G	World Regional Geography		<b>Kinesiology Core</b>		39
GEOG 120G	Culture and Environment		PE P 185	Introduction and Foundations	
GOVT 100G	American National Government		PE P 208	Fitness for Health and Sport	
GOVT 110G	Introduction to Political Science		SP M 271	Anatomy & Physiology I	
GOVT 150G	American Political Issues		SP M 271 L	Anatomy and Physiology Laboratory	
GOVT 160G	International Political Issues		SP M 308	Exercise Physiology	
JOUR 105G	Media and Society		SP M 342	Motor Learning	
LING 200G	Introduction to Language		SP M 371	Anatomy and Physiology II	
PHLS 150G	Personal Health and Wellness		SP M 371 L	Anatomy and Physiology II Lab	
SOC 101G	Introductory Sociology		SP M 445	Internship	
			Choose one from the following:		
			SP M 305 & 305 L	Applied Biomechanics and Applied Biomechanics Laboratory	
			SP M 409 & 409 L	Clinical Biomechanics and Clinical Biomechanics Laboratory	
			Choose one from the following:		
			A ST 251G	Statistics for Business and the Behavioral Sciences	

or STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
A ST 311	Statistical Applications	
SP M 412	Inferential Statistics in Sport and Exercise Science	
<b>Concentration Courses</b>		<b>24</b>
SP M 303	Health and Exercise Psychology	
SP M 304	Psychology of Sport	
<i>Psychology Minor</i>		
Select the official Psychology Minor requiring 18 credit hours in PSY <sup>1</sup>		
<i>Electives</i> <sup>2</sup>		<b>15</b>
<b>Total Credits</b>		<b>120</b>

<sup>1</sup> Courses used for PSY minor cannot also be used for credit as electives.

<sup>2</sup> A list of approved electives can be found on the degree plans (<https://education.nmsu.edu/advising/noteachmaj>).

*Note: Official minor documentation must be completed with the Department of Psychology.*

## Concentration: Physical Education

### Required Courses

#### Area I: English and Communication Arts

ENGL 111G	Rhetoric and Composition	4
Choose one from the following:		
ENGL 211G	Writing in the Humanities and Social Sciences	3
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following:		
COMM 253G	Public Speaking	3
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	

#### Area II: Mathematics 6

Choose one from the following

MATH 121G	College Algebra <sup>2</sup>	
MATH 190G	Trigonometry and Precalculus <sup>2</sup>	
Choose one from the following:		
MATH 210G	Mathematics Appreciation	
MATH 142G	Calculus for the Biological and Management Sciences	

#### Area III: Laboratory Sciences (two different subjects w/labs, must be a G course) 8

BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	

CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
PHYS 110G	The Great Ideas of Physics	
PHYS 120G	Introduction to Acoustics	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	

#### Area IV: Social/Behavioral Sciences 9

C EP 110G	Human Growth and Behavior	
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Choose two from the following:

ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
GEOG 112G	World Regional Geography	
GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
GOVT 160G	International Political Issues	
JOUR 105G	Media and Society	
LING 200G	Introduction to Language	
PHLS 150G	Personal Health and Wellness	
SOC 101G	Introductory Sociology	
SOC 201G	Contemporary Social Problems	
S WK 221G	Introduction to Social Welfare	
W S 201G	Introduction to Women s Studies	
W S 202G	Representing Women Across Cultures	

#### Area V: Humanities and Fine Arts 9

ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
DANC 101G	Dance Appreciation	
ENGL 115G	Perspectives on Literature	
ENGL 116G	Perspectives on Film	
ENGL 220G	Introduction to Creative Writing	
ENGL 244G	Literature and Culture	
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 110G	Making History	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	

HIST 222G	Islamic Civilizations since 1800	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
PHIL 100G	Philosophy, Law and Ethics	
PHIL 101G	The Art of Wondering	
PHIL 124G	Philosophy of Music	
PHIL 136G	The Quest for God	
PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	
PHIL 223G	Ethics	
THTR 101G	The World of Theatre	
<i>Viewing a Wider World (must be from two different colleges, cannot be DANCE 451V/HON 247V)</i>		6
<b>Kinesiology Core</b>		13
PE P 185	Introduction and Foundations	
PE P 208	Fitness for Health and Sport	
SP M 271	Anatomy & Physiology I <sup>2</sup>	
SP M 271 L	Anatomy and Physiology Laboratory <sup>2</sup>	
SP M 342	Motor Learning	
PE P 319	Lifetime Activities	
<i>K-12 Physical Education Concentration Courses</i>		19
PE P 323	Racquet Sports	
PE P 363	Theory and Technique of Lifelong Outdoor Leisure Activities	
PE P 392	Theory and Technique of Sports and Games	
PE P 393	Theory and Technique of Dance and Rhythms	
PE P 394	Designing Student Centered Afterschool Physical Activity Clubs	
SP M 324	Introduction to Exercise Science: Exercise Physiology and Biomechanics	
SP M 341	Motor Development	
<i>Professional Education Courses</i>		28
EDUC 181	Field Experience I <sup>2</sup>	
C EP 210	Educational Psychology <sup>2</sup>	
EDUC 315	Multicultural Education <sup>3</sup>	
SPED 350	Introduction to Special Education in a Diverse Society <sup>2</sup>	
EDLT 368	Integrating Technology with Teaching <sup>2</sup>	
PE P 315	Elementary School Physical Education	
RDG 414	Content Area Literacy <sup>1</sup>	
PE P 455	Adapted Physical Education <sup>1</sup>	
PE P 466	Methods of Teaching Secondary Physical Education <sup>1</sup>	
<i>Student Teaching</i>		12
EDUC 471	Secondary Student Teaching <sup>1</sup>	
EDUC 482	Middle and High School Student Teaching Seminar <sup>1</sup>	
<b>Total Credits</b>		120

<sup>1</sup> Requires admission to Teacher Ed Program (TEP)<sup>2</sup> Pre/co-requisite to Teacher Ed program<sup>3</sup> Must be completed prior to Submission of TEP portfolio<sup>4</sup> Instructor signature required

## Dance - Undergraduate Minor

The dance program also offers a minor in dance that consists of a total of 18 credit hours. Dance minors can choose from a variety of dance technique classes, as well as, dance education and dance production classes.

### Required Courses

DANC 203	Dance Production I	1
DANC 280	Improvisation I	1

### Elective Courses

Select 16 credits (6 credits at upper division) from the following:

DANC 151	Master Works	
DANC 200	Dance Pedagogy: Educational Theory	
DANC 204	Dance Sport I	
DANC 205	Contemporary Dance Ensemble I	
DANC 206	Spanish Dance Ensembles I	
DANC 209	Argentine Tango II	
DANC 210	Classical Spanish II	
DANC 218	West Coast Swing II	
DANC 221	Country Western Dance	
DANC 222	Bronze American Rhythm	
DANC 223	Ballet Technique II	
DANC 224	Jazz Technique II	
DANC 225	Bronze American Smooth	
DANC 226	Modern Dance Technique II	
DANC 227	Tap Dance II	
DANC 229	Flamenco II	
DANC 232	Bronze International Latin	
DANC 235	Bronze International Standard	
DANC 269	DanceSport Choreography I	
DANC 275	Dance Studio Management	
DANC 279	Flamenco Choreography I	
DANC 289	Principles of Choreography I	
DANC 300	Dance Pedagogy: Creative Movement	
DANC 301	Flamenco Pedagogy I	
DANC 304	Dance Sport II	
DANC 305	Contemporary Dance Ensemble II	
DANC 306	Spanish Dance Ensemble II	
DANC 310	Classical Spanish Dance III	
DANC 322	Silver American Rhythm	
DANC 323	Ballet Technique III	
DANC 324	Jazz Technique III	
DANC 325	Silver American Smooth	
DANC 326	Modern Dance III	
DANC 329	Flamenco III	
DANC 332	Silver International Latin	
DANC 335	Silver International Standard	
DANC 339	Flamenco Structure and Improvisation	
DANC 342	DanceSport Pedagogy: Rhythm	

DANC 345	DanceSport Pedagogy: Smooth
DANC 365	Dance Pedagogy: Dance in Education
DANC 380	Improvisation II
DANC 389	Principles of Choreography II
DANC 422	Gold American Rhythm
DANC 423	Ballet Technique IV
DANC 424	Jazz Dance Technique IV
DANC 425	Gold American Smooth
DANC 426	Modern Dance Technique IV
DANC 432	Gold International Latin
DANC 435	Gold International Standard
DANC 466	Dance Pedagogy: Dance Technique

Total Credits 18

## Exercise Science - Undergraduate Minor

### Required Courses

PE P 208	Fitness for Health and Sport	3
SP M 308	Exercise Physiology	3
SP M 330	Exercise Testing and Prescription	4
Select 8 credits from the following:		8
SP M 305	Applied Biomechanics	
SP M 305 L	Applied Biomechanics Laboratory	
SP M 309	Neurophysiology and Human Function	
SP M 451	Advanced Exercise Physiology	
SP M 456	Exercise for Special Populations	
SP M 460	Principles of Strength and Conditioning	
SP M 460 L	Principles of Strength and Conditioning Laboratory	

Total Credits 18

*Note: Official minor documentation must be completed with the Department of Kinesiology and Dance.*

## Kinesiology - Doctor of Philosophy Coursework

The PhD in Kinesiology requires a minimum of 36 credit hours of formal coursework (beyond a masters degree) and an expected 24 credit hours of research and dissertation work. Thus, the minimum expected credit hour accumulation is 60 credit hours.

At least 12 credit hours must come from graduate courses in the department of Kinesiology and Dance, and the student must have at least one course in each of the foundational knowledge content areas (CA) in Kinesiology, including:

1. relationships among physical activity, health, and quality of life
2. scientific foundations for study of physical activity and human movement
3. social, cultural and historical context of the study of physical activity
4. the practice of physical activity.

At least 12 credit hours must be taken in research methodologies, at least 3 credits of which must be in experimental statistics, and at least 3

credits from a qualitative methods course(s). There are many options for these courses on the NMSU campus that will permit the student to meet this requirement.

The remaining 12 credit hours are taken at the direction of the student's advisor and committee, and agreed upon at the time of the student's qualifying exam (see below).

## Examinations

Students seeking the Doctor of Philosophy degree in Kinesiology must pass a qualifying examination that must be completed before accumulating more than 24 credit hours towards their degree, a Comprehensive Exam including written and oral elements that must be completed prior to beginning a final dissertation project, and a Final Exam that features the defense of their final dissertation study.

## Dissertation

The candidate for the degree of Doctor in Philosophy in Kinesiology must complete a dissertation in a focused area of study. The student and his/her committee must agree upon the dissertation topic, and approval of the dissertation requires consent of the plurality of the student's committee members. The student must complete a minimum of 18 dissertation credit hours.

### Graduate courses currently offered in the department of Kinesiology & Dance

SP M 451	Advanced Exercise Physiology <sup>2</sup>	3
SP M 456	Exercise for Special Populations <sup>1,4</sup>	3
SP M 458	Physical Dimensions of Aging <sup>1</sup>	3
SP M 460	Principles of Strength and Conditioning <sup>2,4</sup>	3
SP M 460 L	Principles of Strength and Conditioning Laboratory	1
SP M 508	Applied Biomechanics <sup>1</sup>	3
SP M 509	Clinical Biomechanics <sup>1,2</sup>	3
SP M 510	Graduate Athletic Training Seminar I	1-3
SP M 511	Graduate Athletic Training I	1-3
SP M 512	Inferential Statistics in Sports and Exercise Science	3
SP M 513	Graduate Athletic Training Seminar II	1-3
SP M 514	Graduate Athletic Training Research I	1-3
SP M 515	Graduate Athletic Training II	3
SP M 545	Skill Acquisition and Performance <sup>2</sup>	3
SP M 551	Advanced Exercise Physiology <sup>2</sup>	3
SP M 556	Exercise for Special Populations <sup>1,4</sup>	3
SP M 558	Physical Dimensions of Aging <sup>1</sup>	3
SP M 560	Principles of Strength and Conditioning <sup>2,4</sup>	3
SP M 597	Project	1-12
SP M 600	Kinesiology Research	1-3
SP M 608	Cardiovascular Physiology <sup>2</sup>	3
SP M 660	Designing Resistance Training Program <sup>4</sup>	3
SP M 665	Skeletal Muscle: Structure and Function <sup>2</sup>	3
SP M 700	Doctoral Dissertation	1-18
PE P 455	Adapted Physical Education <sup>4</sup>	3

PE P 465	Senior Seminar	3
PE P 466	Methods of Teaching Secondary Physical Education <sup>4</sup>	6
PE P 499	Problems	1-3
PE P 501	Special Topics	1-3
PE P 550	Advanced Topics in Physical Education	1-4
PE P 551	Sociology of Sports <sup>3</sup>	3
PE P 555	Adapted Physical Education <sup>4</sup>	3
PE P 557	Adapted Physical Education : A Practitioner's Approach <sup>4</sup>	3
PE P 624	The Social Construction of the Body <sup>3</sup>	3
DANC 450	Special Topics	1-3
DANC 451V	World Dance <sup>3</sup>	3
DANC 462	Flamenco Dance History <sup>3</sup>	3
DANC 465	Senior Culminating Experience	1-6
DANC 466	Dance Pedagogy: Dance Technique <sup>4</sup>	3
DANC 489	Advanced Choreographic Project	2
DANC 499	Problems	1-6
DANC 501	Directed Studies	1-4
DANC 505	Dance Ensemble III	1
DANC 550	Special Topics	1-6
DANC 551	Movement as Social Text <sup>3</sup>	3
DANC 566	Advanced Theory of Dance Pedagogy <sup>4</sup>	1-6
DANC 567	Dance Internship I	2
DANC 568	Advanced Theory of Modern Dance Technique <sup>4</sup>	1
DANC 570	Dance Administration and Leadership <sup>3</sup>	2
DANC 599	Master's Thesis	1-6
DANC 600	Dance Research	3
DANC 670	Dance Internship II	3
DANC 700	Doctoral Dissertation	3

<sup>1</sup> Meets content area (CA) 1 requirement

<sup>2</sup> Meets content area (CA) 2 requirement

<sup>3</sup> Meets content area (CA) 3 requirement

<sup>4</sup> Meets content area (CA) 4 requirement

## Special Education/Communication Disorders

### Undergraduate Program Information

The Department of Special Education/Communication Disorders offers two undergraduate programs that prepare professionals to work with exceptional populations in school, community, hospital and residential settings. The Special Education program prepares students to provide educational services to individuals with disabilities. The Communication Disorders program provides training for students interested in speech-language pathology or audiology.

### Graduate Program Information

The Department of Special Education/Communication Disorders offers programs designed for students with career goals as master special education teachers, special education consultants and directors, and speech-language pathologists, or as higher education faculty in the fields

of Special Education and Communication Disorders. The program in Special Education is accredited by the National Council for Accreditation of Teacher Education (NCATE). The Council on Academic Accreditation (CAA) accredits the program in Communication Disorders.

The department offers the following programs leading to a Master's degree:

- MA in Communication Disorders
- MA in Special Education

The department offers the following programs leading to a Doctoral degree:

- Doctor of Education (Ed.D.)
- Doctor of Philosophy (Ph.D.)

For detailed information about these programs, including graduate admissions requirements, please view the degree pages in this catalog or contact the department at 575-646-2401 or <http://spedcd.nmsu.edu/>.

## Degrees for the Department

Autism Spectrum Disorders - Graduate Certificate (<http://catalogs.nmsu.edu/nmsu/education/special-education-communication-disorders/autism-spectrum-disorders-grad-cert>)

Communication Disorders - Bachelor of Science in Education (p. 544)

Special Education - Bachelor of Science in Education (p. 546)

Communication Disorders - Master of Arts (p. 552)

Special Education - Master of Arts (p. 552)

Special Education - Doctor of Education (p. 553)

Special Education - Doctor of Philosophy (p. 554)

## Minors for the Department

Special Education - Graduate Minor (p. 555)

**Associate College Professor, Victoria White, Interim Department Head**

**Associate Professors:** Rhein, Salas, Valdez; **Assistant Professors:** Lehnert-Lehouillier (Program Director in Communication Disorders), Mishra, Mohapatra, Potter, Ramdoss; **College Assistant Professors:** Cobos, Mason; **Emeritus Professors:** Farmer, Gallegos, Poel

*A. Cobos, MA (Arizona State University) dysphagia; H. Lehnert-Lehouillier, Ph.D. (State University of New York at Buffalo) speech science, phonetics, voice & speech sound disorders; L. Mason, Ed.D. (University of Northern Colorado) visual impairment, orientation and mobility, literacy; S. Mishra, Ph.D. (University of Southampton, U.K.) audiology, hearing science and pediatric audiology; B. Mohapatra, Ph.D. (University of Georgia) acquired neurogenic communication disorders, biofeedback training; K. Potter, Ph.D. (University of New Mexico) inclusive practices, disability studies, severe disability/complex supports; S. Ramdoss, Ph.D. (University of Texas at Austin) autism and developmental disabilities, assistive technology, AAC; D. Rhein, Ph.D. (University of Arizona) bilingual language assessment, literacy; L. Salas, Ph.D. (New Mexico State University)– bilingual and multicultural special education, early childhood special education; A. Valdez, Ph.D. (University of New Mexico)– educational psychology; Emeriti: S. Farmer, Ph.D.; E. Poel, Ph.D.; A. Gallegos, Ed.D.*

## Communication Disorders Courses

### C D 221. Introduction to Communication Disorders

#### 3 Credits

Basic information about speech, language, and hearing disorders; orientation to the professions of speech-language pathology and audiology.

### C D 301. Language Acquisition

#### 3 Credits

This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. May be repeated up to 3 credits. Crosslisted with: C D 509. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221; Cumulative GPA of 3.2 or higher.

### C D 322. Anatomy and Physiology of Speech Mechanisms

#### 3 Credits

Structure and function of systems underlying human speech sound production and processing, including respiratory, phonatory, and articulatory components. May be repeated up to 3 credits. Crosslisted with: C D 502. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, and C D 301; and minimum 3.2 GPA.

### C D 323. Phonetics

#### 3 Credits

The science of phonetics, including work with the International Phonetic Alphabet. Taught with C D 501. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221; Cumulative GPA of 3.2 or better.

### C D 324. Introduction to Speech Science

#### 3 Credits

Basic concepts and theories in acoustics, speech production and speech perception. Includes laboratory experience with instrumental measurement and analysis of speech systems. May be repeated up to 3 credits. Crosslisted with: C D 503. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422; and minimum 3.2 GPA.

### C D 325. Language Disorders

#### 3 Credits

Bases, symptoms, etiologies, and treatment of language disorders. Includes review of normal language acquisition. B or better in C D 301/ C D 509,C D 302/C D 593, C D 321, C D 322/C D 502, C D 323/C D 501, and minimum 3.0 GPA. Restricted to C D majors.

**Prerequisite(s):** C- or better in C D 221.

### C D 326. Clinical Methods and Procedures

#### 3 Credits

Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum. May be repeated up to 3 credits. Crosslisted with: C D 506. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, C D 301; and minimum 3.2 GPA.

### C D 374. American Sign Language I

#### 3 Credits

Introduction to the basics of ASL including questions, commands, sentence types, time, subjects and objects, classifiers, locative case, pluralization, and temporal and distributional aspects.

### C D 375. American Sign Language II

#### 3 Credits

Continuation of C D 374, ASL I. Emphasis on ASL grammar, spatial referencing, detailed descriptions, and deaf culture. Features dialogues, short stories, narratives.

**Prerequisite:** C D 374 or consent of instructor.

### C D 421. Speech and Language Disorders

#### 3 Credits

Bases, symptoms, etiologies, and clinical management of issues related to disorders of articulation, phonology, voice and resonance, and fluency. May be repeated up to 3 credits. Crosslisted with: C D 504. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, and C D 301; and minimum 3.2 GPA.

### C D 422. Audiology

#### 3 Credits

Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. May be repeated up to 3 credits. Crosslisted with: C D 507. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, and a minimum of 3.2 GPA.

### C D 423. Neural Bases of Communication Disorders

#### 3 Credits

Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. May be repeated up to 3 credits. Crosslisted with: C D 510. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 301, C D 323, C D 422, C D 324, C D 421, C D 322, C D 326 and minimum 3.0 GPA.

### C D 424. Aural Rehabilitation

#### 3 Credits

Overview of hearing aids and amplification devices including cochlear implants. Review of the bases and psychosocial aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLPs. May be repeated up to 3 credits. Crosslisted with: C D 508. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, C D 301, C D 421, C D 322, C D 326; and minimum 3.2 GPA.

### C D 425. Professional Reasoning and Scientific Thinking

#### 3 Credits

Overview of constructive thinking, problem solving, and decision making theories and strategies associated with professional reasoning and scientific thinking that are to be used academically and clinically in the transition from student to scholar to professional. Taught with C D 593. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, C D 301, C D 421, C D 322, C D 326, and a minimum cumulative GPA of 3.2.

### C D 476. American Sign Language III

#### 3 Credits

Continuation of C D 375, ASL II. Focus on more complex grammatical features. Students will comprehend and generate medium length stories, narratives, and discussions including culturally significant topics.

**Prerequisite:** C D 375.

**C D 501. Phonetics****3 Credits**

The science of phonetics, including work with the International Phonetic Alphabet. Restricted to majors. Same as C D 390 with differentiated assignments for graduate students.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 502. Anatomy and Physiology of Speech Mechanisms****3 Credits**

Structure and function of systems underlying human speech sound production and processing including nervous, respiratory, and articulatory components. Restricted to majors. Same as C D 370 with differentiated assignments for graduate students.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 503. Speech Science****3 Credits (2+3P)**

Basic concepts and theories in acoustics, speech production, and speech perception. Laboratory experience with instrumental measurement and analysis of speech systems. Restricted to majors. Same as C D 380 with differentiated assignments for graduate students.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 504. Speech and Language Disorders****3 Credits**

Bases, symptoms, etiologies, and treatment of language disorders. Includes review of normal language acquisition. Taught C D 421.

**Prerequisite(s):** B or better GPA.

**C D 505. Research Methods****3 Credits**

Introduction to basic qualitative, quantitative, and single subject research methodology in speech-language pathology and audiology. Restricted to majors.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 506. Clinical Methods and Procedures****3 Credits**

Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum.

Differentiated assignments for graduate students. Taught with C D 326. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better GPA.

**C D 507. Audiology****3 Credits**

Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. Differentiated assignments for graduate students. Taught with C D 422. Restricted to: C D, C DS majors.

**Prerequisite(s):** Minimum of 3.0 GPA.

**C D 508. Aural Rehabilitation****3 Credits**

Overview of hearing aids and amplification devices including cochlear implants. Review of the bases and psycho-social aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLPs. Taught with C D 424. Differentiated assignments for graduate students. Restricted to: C D, C DS majors.

**Prerequisite(s):** Minimum 3.0 GPA.

**C D 509. Language Acquisition****3 Credits**

Normal development of communication across the age span. Includes language sampling and analysis. A minimum grade of B- in all graduate courses and a minimum overall GPA of 3.0 required. Taught with C D 360 with differentiated assignments for graduate students. Restricted to CD majors and LING majors.

**C D 510. Neural Bases of Communication Disorders****3 Credits**

Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. Crosslisted with: C D 423. Restricted to: CD, CDS majors.

**C D 521. Professional Issues and Multicultural Practices in Communication Disorders****3 Credits**

This course includes a range of topics pertinent to students entering professional practice as speech-language pathologists including current legal, cultural, ethical, and clinical service provision issues. Restricted to: C DS,C D majors.

**Prerequisite(s):** Minimum of 3.0 GPA.

**C D 522. Interpreter Workplace Skills in Communication Studies****1 Credit**

The purpose of this course is to identify principles and procedures necessary to be an effective interpreter and to use an interpreter in the field speech, language, hearing and swallowing disorders. Students will identify the history the use of interpreters, the interpreting process, bilingual vocabulary appropriate for the scope of practice in the field, bilingual assessment principles, second language learning principles and multicultural aspects to consider in the interview and interpreting process. The students will engage in several interpreter scenarios for interview, assessment and intervention cases. Restricted to: C D majors.

**Prerequisite(s):** Minimum of 3.0 GPA.

**C D 523. Assessment of Communication Disorders****3 Credits**

Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 525. Pediatric Language and Disorders****3 Credits**

Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** Minimum grade of B and an overall GPA of 3.0 or higher.

**C D 530. School Age Language and Disorders****3 Credits**

Normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** A minimum grade of B in all graduate courses and an overall GPA of 3.0 or higher.

**C D 535. Aphasia & Cognitive Linguistic Disorders****3 Credits**

Etiologies, diagnosis, assessment, and treatment of adult aphasia and cognitive-linguistic disorders. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 541. Advanced Spanish Morpho-Syntax for Education Professionals****3 Credits**

This class has been designed for Heritage Speakers of Spanish who work in educational settings. It will cover the essential linguistic theory and fundamental structures of the Spanish language. This includes, but is not limited to, verb morphology, morphosyntactic and syntactic structures. The main goal of this course is to determine what usages fall within the norms of an individual's speech community, or if there are elements that fall outside those norms.

**Prerequisite(s):** Students have to be fluent in Spanish as course will be conducted in Spanish.

**C D 542. Articulation and Phonological Disorders****3 Credits**

Advanced study of the symptoms, etiologies, assessment, and clinical management of articulation and phonological disorders including cleft palate and disorders of resonance Restricted to: C DS,C D majors.

**Prerequisite(s):** A minimum grade of B- in all graduate courses and a minimum overall GPA of 3.0 is required.

**C D 545. Introduction to Augmentative and Alternatice Communication****3 Credits**

Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** Graduate standing; overall GPA of 3.0.

**C D 547. Cognitive-Linguistic Communication Disorders****3 Credits**

Topics include attention, memory, executive function, and underlying neuropathologies, with emphasis on assessment, diagnosis, prognosis, treatment and recovery processes in cognitive communication disorders related to traumatic brain injury, dementia, and right hemisphere brain damage. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0.

**C D 548. Best Practices in Bilingual/Multicultural Assessment for Practitioners****3 Credits**

The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests.

**Prerequisite(s):** C D 594.

**C D 555. Instrumentation in Communication Disorders****2 Credits**

This course will provide graduate students with information regarding the purpose and operation of a variety of perceptual assessment and instrumental tools for the evaluation and treatment of voice, fluency, and resonance disorders. Restricted to: C D majors.

**C D 574. American Sign Language III****3 Credits**

Continuation of ASL II. Focus on more complex grammatical features. Students will comprehend and generate medium length stories, narratives, and discussions including culturally significant topics.

**Prerequisite:** C D 375 or consent of instructor.

**C D 583. Dysphagia****3 Credits**

Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 584. Fluency Disorders****3 Credits**

Speech fluency development and the disorders of stuttering, cluttering, and neurogenic dysfluency. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 585. Motor Speech Disorders****3 Credits**

Advanced studies of dysfunction of the nervous system that affect speech. Includes evaluation, diagnosis, and treatment of speech apraxias and dysarthrias. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 586. Voice Disorders/Head and Neck Anomalies****3 Credits**

Advanced studies of anatomy and physiology of the vocal tract with emphasis on diagnosis, assessment, and treatment of voice disorders, laryngectomy, cleft palate, and other oral-facial anomalies. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 587. Cleft Palate and Syndromes****2 Credits**

An advanced study of etiology, assessment and treatment of craniofacial anomalies with a focus on the effects of clefts of the lip and/or palate on speech, resonance and velopharyngeal dysfunction. Review of the contribution of interdisciplinary cleft palate team care managing feeding, audiologic, surgical, orthodontic, and psychosocial aspects. General review of embryology and common syndromes with associated speech, language, and hearing disorders. Consent of Instructor required. Restricted to: C D,C DS majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 589. Practicum in Speech-Language Pathology****1-4 Credits (1-4)**

Supervised clinical practice in a variety of speech, language, and hearing disorders. Practicum includes diagnostic, treatment, and management work through direct patient/client contact. Attendance at weekly clinical staff meetings is required. May be repeated up to 15 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** Good standing in the graduate school; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 590. Clinical Education****1 Credit**

This course is specifically designed to target the knowledge base necessary to initiate clinical practicum in the CD Program. The learning objectives are based upon the Council of Academic Accreditation in Audiology and Speech-language Pathology (CAA) standards and knowledge areas. These learning outcomes are developed to assist students in clinical practicum and are specific to the services provided to clients of the NMSU Edgar R. Garrett Speech and Hearing Center.

Restricted to: C DS,C D majors.

**Corequisite(s):** C D 589.

**C D 591. Special Topics****1-9 Credits**

Individual and/or group study of special topics identified by subtitle. May be repeated up to 9 credits. Restricted to: C DS majors.

**Prerequisite(s):** Prior arrangement with faculty; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 599. Master's Thesis****15 Credits**

Thesis.

**C D 640. Externship in Communication Disorders****3-9 Credits (3-9)**

This course is designed to provide opportunities for the developing clinician to provide treatment to and evaluations for clients in a full term externship experience under the supervision of a licensed SLP. May be repeated up to 9 credits. Consent of Instructor required. Restricted to: C DS,C D majors.

## Special Education Courses

**SPED 201. Topics****3 Credits**

Offered under various subtitles that indicate the subject matter to be covered. May be repeated 3 times for a maximum of 9 credits.

**SPED 202. Culture, Learning and Academic Achievement in a Diverse Society****3 Credits**

Development of culturally responsive learning strategies, skills and utilization of support services, to enhance academic achievement. Restricted to: Main campus only.

**SPED 210. Introduction to Special Education****3 Credits**

For paraprofessional students who will be working with a teacher in a Special Education classroom. This class will provide an overview of characteristics of children with special needs, legal issues, framework of effective instruction and a variety of practical teaching and learning strategies that are relevant to the tasks and academic demands required in inclusive classrooms.

**SPED 350. Introduction to Special Education in a Diverse Society****3 Credits**

Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners.

**SPED 355. Introduction to Bilingual/Multicultural Special Education****3 Credits**

Introduction to issues related to the provision of services to culturally and linguistically diverse students with exceptionalities. Same as BIL 355.

**SPED 360. Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society****3 Credits**

Curriculum theory and development for special education programs. Various teaching methods utilized with elementary exceptional learners and techniques involved in identifying, adapting, and developing materials will be addressed.

**SPED 406. High Incidence Disabilities in a Diverse Society****3 Credits**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders.

**SPED 407. Low Incidence Disabilities in a Diverse Society****3 Credits**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations.

**SPED 409. Reading for Elementary Exceptional Learners in a Diverse Society, K-6****3 Credits**

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 509.

**SPED 411. Reading for Elementary Exceptional Learners in a Diverse Society, 7-12****3 Credits**

Extends information covered in SPED 509, which covers grades K 6. Strategies and materials are addressed.

**SPED 450. Working with Young Children with Special Needs, Ages 3-8****3 Credits**

Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with SPED 550.

**Prerequisite(s):** SPED 350 or equivalent.

**SPED 451. Assessment of Young Children, Birth-Eight****3 Credits**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as SPED 551.

**Prerequisite:** SPED 450.

**SPED 452. Foundations of Visual Impairment****3 Credits**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. Taught with SPED 532 and SPED 632. Consent of Instructor required.

**SPED 453. Functional Implications of Low Vision****3 Credits**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Taught with SPED 533 and SPED 633.

**SPED 454. Strategies for Teaching Students with Visual and Multiple Impairments**  
**3 Credits**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Taught with SPED 534 and SPED 634.

**Prerequisite(s):** SPED 453.

**SPED 455. Braille I: Literacy for Students with Visual Impairments**  
**3 Credits**

This course facilitates an in-depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Taught with SPED 536 and SPED 636.

**SPED 457. Braille II: Literacy Skills for Students with Visual Impairments**  
**3 Credits**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Taught with SPED 538 and SPED 638.

**Prerequisite(s):** SPED 455 or SPED 536 or SPED 636 or Consent of Instructor.

**SPED 459. Classroom Management for Diverse Learners**  
**3 Credits**

Behavior-change strategies for exceptional learners.

**SPED 460. Strategies for Teaching Students with Visual Impairments**  
**3 Credits**

This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptations, IFSP/IEP/ITP planning, and evidence-based practices. Taught with SPED 539 and SPED 639. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 453, SPED 455, SPED 457 or Consent of Instructor.

**SPED 463. Introduction to Assessment of Diverse Exceptional Learners**  
**3 Credits**

Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs.

**SPED 470. Life Span Development and Transition in a Diverse Society**  
**3 Credits**

Special problems associated with transitions over the life span, with emphasis on adolescent and adult needs. Attention to service approaches for public schools, sheltered workshops, residential hospitals, and group homes.

**SPED 480. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society**  
**3 Credits**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 580.

**SPED 481. Practicum in Education, Equity and Cultural Diversity**  
**3 Credits**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. Restricted to: SPED majors.

**Prerequisite(s):** SPED 350 and SPED 360 or consent of instructor.

**SPED 482. Student Teaching SPED**  
**12 Credits**

Supervised teaching in a special education classroom and participation in a required seminar. Restricted to: SPED majors.

**Prerequisite(s):** SPED 481 and admission to student teaching.

**SPED 483. Early Childhood SPED Student Teaching**  
**6 Credits**

A student teaching experience designed for students studying early childhood special education. Restricted to majors. Same as SPED 583.

**Prerequisites:** Admission to student teaching.

**SPED 485. Introduction to Autism**  
**3 Credits**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 585 and SPED 685.

**SPED 486. Behavior and Autism**  
**3 Credits**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 586 and SPED 686 with differentiated assignments.

**Prerequisite(s)/Corequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 487. Social Skills and Autism**  
**3 Credits**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 587 and SPED 687 with differentiated assignments.

**Prerequisite(s)/Corequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 488. Communication and Autism**  
**3 Credits**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 588 and SPED 688 with differentiated assignments.

**Prerequisite(s):** SPED485 or SPED585 or SPED685.

**SPED 489. Topics****3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated 3 times for a maximum of 9 credits.

**SPED 495. Directed Study courses in Special Education****1-3 Credits**

Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits.

**SPED 500. Introduction to Special Education in a Diverse Society****3 Credits**

This course introduces the field of special education to regular educators.

**SPED 501. Topics in Special Education****1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 502. Problems****1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 503. Contemporary Development****1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 504. Introduction to Assessment of Diverse Exceptional Learners****3 Credits**

Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students. Crosslisted with: SPED 463. Restricted to: SPED majors.

**SPED 506. High Incidence Disabilities in a Diverse Society****3 Credits**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders.

**SPED 507. Low Incidence Disabilities in a Diverse Society****3 Credits**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 607 with differentiated assignments.

**SPED 508. Nature and Needs of Gifted Learners****3 Credits (3)**

An introductory course in the education of gifted students. The course provides an overview of the current and historical issues in the field. The intellectual, social, emotional, development, and educational characteristics of gifted students are introduced. Appropriate educational opportunities and programming are discussed. Issues in identification of the gifted, special gifted populations, and current research are reviewed. Taught with SPED 608

**SPED 509. Reading for Elementary Exceptional Learners in a Diverse Society, K-6****3 Credits**

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 409.

**SPED 510. Current Issues in Special Education for Teaching in Culturally Responsive Society****3 Credits**

Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 610.

**SPED 511. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12****3 Credits**

Extends information covered in SPED 509, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 411.

**SPED 512. Curriculum for Gifted Learners****3 Credits (3)**

This course focuses upon the development of appropriate curriculum, courses, and units for gifted learners. Taught with SPED 612.

**SPED 513. Current Research in Special Education****3 Credits**

Current investigations and research techniques.

**SPED 514. Twice Exceptional and Special Populations of Gifted Learners****3 Credits (3)**

This course is designed for all professional personnel who work with students who are gifted. It focuses on special populations of gifted learners who possess unique characteristics and needs. Emphases are placed on issues related to the characteristics, identification, and development of appropriate educational services for twice exceptional and special populations of gifted learners. Taught with SPED 614

**SPED 516. Strategies for Teaching Gifted Learners****3 Credits (3)**

This course comprehensively reviews teaching-learning models that can be used in the development and implementation of a curriculum for gifted students. The field of gifted education has seen new program models developed, more research accomplished, and new materials published, and this class examines these changes. Taught with SPED 616

**SPED 519. School Interventions and Organization in a Diverse Society****3 Credits**

Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. Restricted to majors. Taught with SPED 619.

**SPED 520. Reading Disabilities Structure of Language****3 Credits**

The purpose of this course is to introduce the student to the structure of language, including phonology, morphology, syntax, semantics, and to orthography. In addition, students in this course will study each area of language and able to use this information in analyzing the process of reading and writing.

**SPED 521. Intervention Techniques for Reading Disabilities****3 Credits**

This course focuses on the systematic and explicit teaching of reading and writing skills. Included will be a summation of the most current reading research and its relevance to the field.

**SPED 522. Practicum in Reading Disabilities****3 Credits**

Supervised experience in assessing a student with reading disability, developing and intervention plan, and implementing and monitoring the interventions across time.

**SPED 523. Advanced Curriculum for Diverse Exceptional Learners****3 Credits**

Strategies for developing curricula appropriate to handicapped and gifted learners.

**Prerequisite:** SPED 360 or consent of instructor.

**SPED 532. Foundations of Visual Impairment****3 Credits**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. Taught with SPED 452 and SPED 632 with differentiated assignment.

**SPED 533. Functional Implications of Low Vision****3 Credits**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Taught with SPED 453 and SPED 633.

**SPED 534. Strategies for Teaching Students with Visual and Multisensory Impairments****3 Credits**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Taught with SPED 454 and SPED 634.

**Prerequisite(s):** SPED 533.

**SPED 536. Braille I: Literacy for Students with Visual Impairments****3 Credits**

This course facilitates an in depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Taught with SPED 455 and SPED 636.

**SPED 537. Independent Readings in Special Education****1-3 Credits**

Each course shall be identified by a qualifying subtitle. Maximum of 6 credits, 3 credits per semester.

**SPED 538. Braille II: Numeracy for Students with Visual Impairments****3 Credits**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Taught with SPED 457 and SPED 638 with differentiated assignments.

**Prerequisite(s):** SPED 455 or SPED 536 or SPED 636 consent of instructor.

**SPED 539. Strategies for Teaching Students with Visual Impairments****3 Credits**

This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptations, IFSP/IEP/ITP planning, and evidence-based practices. Taught with 460 and SPED 639. Restricted to: SPED majors.

**Prerequisite(s):** SPED 533, SPED 536, SPED 538.

**SPED 541. Assessment of Reading and Writing****3 Credits**

Differential diagnosis of reading and writing disabilities is the focus of this course. Students will develop competencies to diagnose different types of reading problems, including dyslexia. Students will be taught how accurate differential diagnosis leads directly to targeted intervention.

**SPED 545. Technology and Exceptionality in a Diverse Society****3 Credits**

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 645.

**SPED 548. Field Experience in Education, Equity & Cultural Diversity****3 Credits**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. This experience is designed for both the practicing general education classroom teacher pursuing special education licensure and for graduate teacher candidates pursuing initial special education licensure. Restricted to: SPED majors.

**Prerequisite(s):** SPED 350 and SPED 360, or SPED 500 and SPED 523, or consent of instructor.

**SPED 550. Working with Young Children with Special Needs, Ages 3-8****3 Credits**

Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Same as SPED 450 with differentiated assignments for graduate students. Same as ECED 550.

**Prerequisite:** SPED 500 or equivalent, or consent of instructor.

**SPED 551. Assessment of Young Children, Birth Eight****3 Credits**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as SPED 451.

**Prerequisite:** SPED 550 or consent of instructor.

**SPED 552. Introduction to Orientation and Mobility****3 Credits**

This course provides an overview of the history and theory of formalized orientation and mobility instruction as it relates to the ability to live independently. The impact of visual impairment and concomitant impairments on the development of spatial concepts and motor skills in relation to independent locomotion is emphasized. Topics covered include mobility aids; navigation, familiarization, and protective techniques; structured pre-cane assessment and instruction; the development and use of tactual maps; and the relationship of orientation and mobility to other areas of the expanded core curriculum. Consent of Instructor required. Restricted to: SPED, EDUC majors.

**SPED 553. Beginning Orientation and Mobility****3 Credits**

This course provides an overview of the profession of orientation and mobility and how sensory, motor, and psychosocial function affects movement and spatial orientation. Consent of Instructor required.

Restricted to: SPED majors.

**Prerequisite(s):** SPED 552.

**SPED 554. Intermediate Orientation and Mobility****3 Credits**

This course focuses on strategies and methods for conducting assessments and appropriately sequencing skill acquisition for learners across the lifespan who may or may not have additional disabilities. Adaptive technology and other aids that assist with travel in a variety of environmental conditions using different mobility systems will also be covered. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 553.

**SPED 555. Advanced Orientation and Mobility****3 Credits**

This course focuses on the development and monitoring of cane skills needed for safe and efficient travel in indoor, residential, and business districts, including the use of public transportation systems. Development, administration, and supervision of orientation and mobility services is also covered. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 554.

**SPED 559. Classroom Management for Diverse Learners****3 Credits**

Behavior-change strategies for exceptional learners. Taught with SPED 459 with differentiated assignments for graduate students.

**SPED 570. Life Span Development and Transition in a Diverse Society****3 Credits**

Covers special problems associated with transitions over the life span, with emphasis on adolescent and adult needs. Attention to service approaches for public schools, sheltered workshops, residential hospitals, and group homes. Taught with SPED 470.

**SPED 580. Curriculum, Methods, and Materials for Secondary Special Education****3 Credits**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 480.

**SPED 582. Student Teaching SPED****12 Credits**

Culminating course required for graduate level students seeking initial licensure. Restricted to: SPED majors.

**Prerequisite(s):** Bachelor's degree, SPED 548, and admission to student teaching.

**SPED 585. Introduction to Autism****3 Credits**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 485 and SPED 685. Differentiated Assignments.

**SPED 586. Behavior and Autism****3 Credits**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 486 and SPED 686 with differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 587. Social Skills and Autism****3 Credits**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 487 and SPED 687 with differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 588. Communication and Autism****3 Credits**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 488 and SPED 688 with differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 590. Masters Degree Seminar****3 Credits**

Capstone review of current issues in special education. Each student will participate in a practice comprehensive oral exam.

**SPED 598. Special Research Problems****1-3 Credits**

Individual investigation either analytical or experimental. May be repeated for a maximum of 6 credits, 3 credits per semester.

**SPED 599. Master's Thesis****15 Credits**

Thesis.

**SPED 600. Doctoral Research****1-15 Credits**

Research.

**SPED 605. Independent Study Topics in Special Education****1-6 Credits**

A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle.

**SPED 606. High Incidence Disabilities in a Diverse Society****3 Credits**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 506. Restricted to SPED and C D majors.

**Prerequisite:** Master's Degree.

**SPED 607. Low Incidence Disabilities****3 Credits**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 507 with differentiated assignments.

**SPED 608. Nature and Needs of Gifted Learners****3 Credits (3)**

An introductory course in the education of gifted students. The course provides an overview of the current and historical issues in the field. The intellectual, social, emotional, development, and educational characteristics of gifted students are introduced. Appropriate educational opportunities and programming are discussed. Issues in identification of the gifted, special gifted populations, and current research are reviewed. Taught with SPED 508

**SPED 610. Current Issues in Special Education for Teaching in a Culturally Responsive Society****3 Credits**

Required for students seeking the Ed.D./Ph.D. Taught with SPED 510.

**SPED 612. Curriculum for Gifted Learners****3 Credits (3)**

This course focuses upon the development of appropriate curriculum, courses, and units for gifted learners. Taught with SPED 512

**SPED 613. Current Research in Special Education****3 Credits**

Required for students seeking the Ed.D./Ph.D. Restricted to majors. Same as SPED 513.

**Prerequisite:** M.A. degree.

**SPED 614. Twice Exceptional and Special Populations of Gifted Learners****3 Credits (3)**

This course is designed for all professional personnel who work with students who are gifted. It focuses on special populations of gifted learners who possess unique characteristics and needs. Emphases are placed on issues related to the characteristics, identification, and development of appropriate educational services for twice exceptional and special populations of gifted learners. Taught with SPED 514

**SPED 616. Strategies for Teaching Gifted Learners****3 Credits (3)**

This course comprehensively reviews teaching-learning models that can be used in the development and implementation of a curriculum for gifted students. The field of gifted education has seen new program models developed, more research accomplished, and new materials published, and this class examines these changes. Taught with SPED 516.

**SPED 619. School Intervention and Organization in a Diverse Society****3 Credits**

Introduces public school organization and laws and the psychosociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. Restricted to majors. Taught with SPED 519.

**SPED 632. Foundations of Visual Impairment****3 Credits**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. Taught with SPED 452 and SPED 532.

**SPED 633. Functional Implications of Low Vision****3 Credits**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Taught with SPED 453 and SPED 533.

**SPED 634. Strategies for Teaching Students with Visual and Multiple Impairments****3 Credits**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Taught with SPED 454 and SPED 534.

**Prerequisite(s):** SPED 633.

**SPED 636. Braille I: Literacy for Students with Visual Impairments****3 Credits**

This course facilitates an in-depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Taught with SPED 455 and SPED 536.

**SPED 638. Braille II: Numeracy for Students with Visual Impairments****3 Credits**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Taught with SPED 457 and SPED 538.

**Prerequisite(s):** SPED 455 or SPED 536 or SPED 636.

**SPED 639. Strategies for Teaching Students with Visual Impairments****3 Credits**

This course covers assessment, curricular adaptation's, knowledge of transition age, young children with multiple disabilities, and assistive technology. Taught with SPED 460 and SPED 539. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 633, SPED 636, SPED 638 or Consent of Instructor.

**SPED 640. Internship in Special Education****1-6 Credits**

Each course bears a qualifying subtitle. Maximum of 6 credits per semester.

**SPED 645. Technology and Exceptionality in a Diverse Society****3 Credits**

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 545.

**SPED 662. Elementary Curriculum Methods and Materials for Special Education in a Diverse Society****3 Credits**

ESL and bilingual methods applied to bilingual exceptional students. Appropriate curriculum needs and materials development are also included. Taught with SPED 360, SPED 562.

**SPED 685. Introduction to Autism****3 Credits**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Differentiated Assignments. Taught with SPED 585 and SPED 485.

**SPED 686. Behavior and Autism****3 Credits**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 486 and SPED 586 with differentiated assignments.

**Prerequisite(s):** SPED485 or SPED585 or SPED685.

**SPED 687. Social Skills and Autism****3 Credits**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 487 and SPED 587 with differentiated assignments.

**Prerequisite(s)/Corequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 688. Communication and Autism****3 Credits**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 488 and SPED 588 and differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 690. Doctoral Seminar****1-4 Credits (1-4)**

The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. Same as CD 690.

**SPED 698. Selected Topics in Special Education****1-6 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 700. Dissertation****9 Credits**

Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated for a maximum of 24 credits. Restricted to majors.

**Name:** Dr. Victoria White, Interim Department Head

**Name:** Briana Borunda, Administrative Assistant

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**Website:** <https://spedcd.nmsu.edu/>

## Communication Disorders - Bachelor of Science in Education

The Communication Disorders curriculum provides specialized preparation for students who plan to enter a graduate program in speech-language pathology or audiology. Students supplement their academic study of typical communication development, communication disorders, and clinical management with observation of the clinical experience in the department's Edgar R. Garrett Speech and Hearing Center and/or via alternative clinical education such as virtual patients. Students must maintain a B or better in all CD courses and maintain a cumulative GPA of 3.2 or higher, to remain in the program.

The undergraduate program provides approximately one-half of the academic requirements needed for certification by the American Speech-Language-Hearing Association and licensure by the New Mexico Regulations & Licensing Department. Certification and licensure at state and national levels require completion of the master's degree. Details regarding certification are available from the American Speech-Language-Hearing Association (<http://www.asha.org/certification>) (ASHA), and the New Mexico Regulations & Licensing Department ([http://www.rld.state.nm.us/boards/speech\\_language\\_pathology\\_audiology\\_and\\_hearing\\_aid\\_dispersing\\_practices.aspx](http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispersing_practices.aspx)).

Professional employment opportunities for speech-language pathologists and audiologists are numerous within settings such as school systems, community clinics, medical centers, hospitals, private practice, residential programs and schools for individuals with disabilities.

### Program Requirements

Required coursework (120 credits; minimum 51 upper-division credits)

Electives to meet the 120 minimum credit hours for this degree can either come from any minor that a student chooses to pursue or any other elective courses not counting elsewhere towards the degree. Recommended minors for this degree are Linguistics, Spanish, or CEP.

#### General Education Requirements

<i>Area I: English and Communication</i>		
ENGL 111G	Rhetoric and Composition	4
Choose one from the following:		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
ENGL 311G	Advanced Composition	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II: Mathematics</i>		
MATH 121G	College Algebra ((any MATH beyond 121G))	3
Choose one from the following:		3

A ST 251G	Statistics for Business and the Behavioral Sciences	
or STAT 251G	Statistics for Business and the Behavioral Sciences	
STAT 271G	Statistics for Psychological Sciences	
A ST 311	Statistical Applications	
<i>Area III: Laboratory Science</i>		
Choose one sequence from the following:		4
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
Choose one from the following:		4
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
PHYS 110G	The Great Ideas of Physics	
PHYS 120G	Introduction to Acoustics (recommended)	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
<i>Area IV: Social and Behavioral Sciences</i>		
PSY 201G	Introduction to Psychology	3
SOC 101G	Introductory Sociology	3
or SOC 201G	Contemporary Social Problems	
Choose one from the following:		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
<i>Area V: Humanities and Fine Arts</i>		
Choose one from the following:		3
ENGL 115G	Perspectives on Literature	
ENGL 116G	Perspectives on Film	
ENGL 220G	Introduction to Creative Writing	
ENGL 244G	Literature and Culture	
Select one additional course from the following:		3
ART 101G	Orientation in Art	
ART 110G	Visual Concepts	
DANC 101G	Dance Appreciation	
HIST 101G	Roots of Modern Europe	
HIST 102G	Modern Europe	
HIST 110G	Making History	
HIST 111G	Global History to 1500	
HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	
HIST 202G	Introduction to Recent American History	
HIST 211G	East Asia to 1600	
HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	
HIST 222G	Islamic Civilizations since 1800	
MUS 101G	An Introduction to Music	
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures	
PHIL 100G	Philosophy, Law and Ethics	
PHIL 101G	The Art of Wondering	
PHIL 124G	Philosophy of Music	
PHIL 136G	The Quest for God	
PHIL 201G	Introduction to Philosophy	
PHIL 211G	Informal Logic	
THTR 101G	The World of Theatre	
<b>Viewing a Wider World Courses (must be from two different colleges)</b>		6
<b>Major Requirements (non-CD courses)</b>		
C EP 110G	Human Growth and Behavior	3
LING 200G	Introduction to Language	3
LING 302V	Language and Society	3
or LING 303	Exploring Language Systems	
C D 374	American Sign Language I (Spanish courses listed or higher)	3
or SPAN 111	Elementary Spanish I	
or SPAN 113	Spanish for Heritage Learners I	
or SPAN 211	Intermediate Spanish I	
C D 375	American Sign Language II (Spanish courses listed or higher)	3
or SPAN 112	Elementary Spanish II	
or SPAN 212	Intermediate Spanish II	
or SPAN 213	Spanish for Heritage Learners II	
C EP 451V	Introduction to Counseling	3
<b>Major Requirements (CD courses)</b>		
C D 221	Introduction to Communication Disorders <sup>1</sup>	3
C D 323	Phonetics	3
C D 422	Audiology	3
C D 301	Language Acquisition <sup>1</sup>	3
C D 324	Introduction to Speech Science	3
C D 322	Anatomy and Physiology of Speech Mechanisms	3
C D 326	Clinical Methods and Procedures	3
C D 421	Speech and Language Disorders	3
C D 423	Neural Bases of Communication Disorders	3
C D 424	Aural Rehabilitation	3
C D 425	Professional Reasoning and Scientific Thinking	3
<b>Electives: to bring total to 120</b>		24
Total Credits		120

## Special Education - Bachelor of Science in Education

The undergraduate special education program is an NCATE accredited program designed to prepare teacher candidates for dual licensure in special education and either elementary or secondary education. Students graduate with the preparation to teach in environments across the continuum of special education services. In addition to special education coursework, students complete an academic teaching field within their dual major (elementary or secondary).

Students should meet with the College of Education Undergraduate Resource Center to plan appropriate general education courses for a special education major. See "General Requirements" in the "College of Education (p. 465)" section. Students must be admitted to the Teacher Education Program as a condition for enrolling in courses that lead to licensure. Students must pass ENGL, MATH, all education, and teaching field/concentration courses with a C- or better.

### Special Education Elementary Education (Language Arts)

#### GENERAL EDUCATION REQUIREMENTS

<i>Area I English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition <sup>1</sup>	4
ENGL 211G	Writing in the Humanities and Social Sciences	3
or ENGL 311G	Advanced Composition	
ENGL 363	Literature for Children and Young Adults <sup>2</sup>	3
COMM 253G	Public Speaking <sup>2</sup>	3
or COMM 265G	Principles of Human Communication	
<i>Area II Mathematics</i>		
MATH 111	Fundamentals of Elementary Mathematics I <sup>1</sup>	3
MATH 112G	Fundamentals of Elementary Math II <sup>1</sup>	3
<i>Area III Laboratory Sciences</i>		
Choose two from two different subject areas		8
ASTR 105G	The Planets	
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	
E S 110G	Introductory Environmental Science	
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	
PHYS 110G	The Great Ideas of Physics	

PHYS 120G	Introduction to Acoustics	
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
<i>Area IV Social/Behavioral Sciences</i>		
C EP 110G	Human Growth and Behavior	3
Choose one from the following courses		3
GEOG 112G	World Regional Geography	
or GEOG 120G	Culture and Environment	
GOVT 100G	American National Government	
or GOVT 110G	Introduction to Political Science	
LING 200G	Introduction to Language <sup>3,4</sup>	3
<i>Area V Humanities and Fine Arts</i>		
HIST 111G	Global History to 1500	3
or HIST 112G	Global History Since 1500	
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
Choose one from the following courses		3
ART 101G	Orientation in Art	
DANC 101G	Dance Appreciation	
MUS 101G	An Introduction to Music	
THTR 101G	The World of Theatre	
<i>Viewing the Wider World (6 credits from two different colleges)</i>		6
<b>Education Core Requirements</b>		
EDUC 103	Introduction with Internship in Bilingual Education/ESL <sup>1</sup>	3
SPED 350	Introduction to Special Education in a Diverse Society <sup>1</sup>	3
EDLT 368	Integrating Technology with Teaching <sup>1</sup>	3
SPED 459	Classroom Management for Diverse Learners	3
SPED 463	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 406	High Incidence Disabilities in a Diverse Society <sup>2</sup>	3
SPED 407	Low Incidence Disabilities in a Diverse Society <sup>2</sup>	3
SPED 481	Practicum in Education, Equity and Cultural Diversity <sup>2,5</sup>	3
SPED 482	Student Teaching SPED <sup>2</sup>	12
<b>Elementary Education Teaching Methods</b>		
EDUC 343	Language, Literacy, and Culture in the ESL Classrooms <sup>2,4</sup>	3
EDUC 451	Methods of Teaching Elementary School Science <sup>2</sup>	3
EDUC 452	Methods of Teaching Elementary School Mathematics <sup>2</sup>	3
RDG 360	Elementary School Literacy I <sup>2,3</sup>	3
SPED 360	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society <sup>2</sup>	3
EDUC 342	Sheltered English Instruction for the ESL Classroom <sup>2,4</sup>	3

EDUC 454	Methods of Teaching Elementary School Social Studies <sup>2</sup>	3
EDUC 483	Second Language Acquisition <sup>2,4</sup>	3
RDG 361	Elementary School Literacy II <sup>2,3</sup>	3
RDG 371	Instruction for Special Reading Needs <sup>2,3</sup>	3
<i>Remaining Bilingual/TESOL Courses</i>		
EDUC 204	Foundations of Bilingual/ESL Education <sup>1,4</sup>	3
EDUC 344	Issues in Schooling for Bilingual Learners <sup>4</sup>	3
LING 302V	Language and Society <sup>2,4</sup>	3
SPED 355	Introduction to Bilingual/Multicultural Special Education <sup>2,4</sup>	3
Total Credits		129

<sup>1</sup> Courses are pre/co-requisites for Teacher Education Program (TEP)

<sup>2</sup> Course requires admission to the Teacher Education Program (TEP)

<sup>3</sup> Course counts toward the Language Arts Teaching Field/Concentration

<sup>4</sup> Course counts toward the Bilingual/TESOL endorsement

<sup>5</sup> Requires a minimum of 90 practicum clock hours; Prerequisite-Elementary Education Teaching Methods

## Special Education Secondary Education (Language Arts)

### GENERAL EDUCATION REQUIREMENTS

<i>Area I English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition <sup>1</sup>	4
<i>Area II Mathematics</i>		
MATH 121G	College Algebra <sup>1</sup>	3
or MATH 190G	Trigonometry and Precalculus	
MATH 210G	Mathematics Appreciation	3
or MATH 142G	Calculus for the Biological and Management Sciences	
<i>Area III Laboratory Sciences</i>		
Choose two from two different subject areas with labs		
ASTR 105G	The Planets	8
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	3
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	3
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	3
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	3
GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	3
GEOG 111G	Geography of the Natural Environment	
<i>Area IV Social/Behavioral Sciences</i>		
C EP 110G	Human Growth and Behavior	3

JOUR 105G	Media and Society (Language Arts Teaching Field/Concentration)	3
Choose one from the following courses		
ANTH 120G	Human Ancestors	3
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	3
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	3
GEOG 112G	World Regional Geography	
GOVT 100G	American National Government	3
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	3
GOVT 160G	International Political Issues	
SOC 101G	Introductory Sociology	3
or SOC 201G	Contemporary Social Problems	
<i>Area V Humanities and Fine Arts</i>		
HIST 101G	Roots of Modern Europe	3
or HIST 102G	Modern Europe	
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
THTR 101G	The World of Theatre (Language Arts Teaching Field/Concentration)	3

Viewing the Wider World (6 credits from two different colleges; 3 additional credits satisfied with teaching field/concentration)

LIB 311V	Information Literacy	3
<b>Secondary Education Requirements</b>		
EDUC 281	Introduction to Secondary Education and Youth <sup>1,3</sup>	3
SPED 350	Introduction to Special Education in a Diverse Society <sup>1</sup>	3
EDLT 368	Integrating Technology with Teaching (Pre/Co-requisite for TEP admission)	3
EDUC 342	Sheltered English Instruction for the ESL Classroom <sup>2</sup>	3
EDUC 495	Directed Study Courses in Education (Secondary Data Literacy and Assessment) <sup>2</sup>	3
EDUC 460	Teaching Language Arts at the Middle and High School Level <sup>2,3</sup>	3
RDG 414	Content Area Literacy <sup>2</sup>	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society <sup>2</sup>	3
SPED 482	Student Teaching SPED <sup>2</sup>	12
<b>Special Education Core Requirements</b>		
SPED 459	Classroom Management for Diverse Learners (Prerequisite SPED 350)	3
SPED 463	Introduction to Assessment of Diverse Exceptional Learners (Prerequisite SPED 350)	3
SPED 406	High Incidence Disabilities in a Diverse Society <sup>2</sup>	3

SPED 407	Low Incidence Disabilities in a Diverse Society	3
SPED 481	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 489) <sup>2, 3, 4</sup>	3
RDG 371	Instruction for Special Reading Needs <sup>2</sup>	3
EDUC 489	Topics (Dual License Practicum; Prerequisite EDUC 460) <sup>2, 3, 4</sup>	3
<b>Language Arts Teaching Field/Concentration Requirements</b>		
COMM 253G or COMM 265G	Public Speaking Principles of Human Communication	3
ENGL 311G or ENGL 318G	Advanced Composition <sup>2</sup> Advanced Technical and Professional Communication	3
ENGL 251 or ENGL 252	Survey of American Literature I Survey of American Literature II	3
ENGL 271 or ENGL 272	Survey of English Literature I Survey of English Literature II	3
ENGL 310	Critical Writing	3
Choose one from the following courses		3
ENGL 339V	Chicana/o Literature	
ENGL 341V	American Indian Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Choose one from the following courses		3
ENGL 405	Chaucer	
ENGL 429	British Romanticism	
ENGL 438	Literature of the American Renaissance	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 444	Modern British Fiction	
ENGL 458	Latino/a Literature and Culture	
ENGL 463	Advanced Study in English Literature	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 493	Middle English Textual Cultures	
ENGL 408 or ENGL 409	Shakespeare I Shakespeare II	3
Choose one from the following courses		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
ENGL 416	Approaches to Literature	3
ENGL 470	Approaches to Composition	3
ENGL 400+	Literature Elective	3
Total Credits		132

<sup>1</sup> Course prerequisite for the Teacher Education Program (TEP) admission

<sup>2</sup> Course requires admission to the Teacher Education Program (TEP)

<sup>3</sup> Course requires field experience

<sup>4</sup> SPED 481 requires 90 practicum hours; EDUC 489 requires 100 practicum hours

## Special Education Secondary Education (Math)

### GENERAL EDUCATION REQUIREMENTS

<i>Area I English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition <sup>1</sup>	4
Choose one from the following courses		3
ENGL 211G	Writing in the Humanities and Social Sciences <sup>1</sup>	
ENGL 311G	Advanced Composition <sup>1</sup>	
ENGL 318G	Advanced Technical and Professional Communication <sup>1</sup>	
Choose one from the following courses		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II Mathematics (Met with Math Teaching Field/Concentration)</i>		
<i>Area III Laboratory Sciences</i>		
Choose one from the following courses		4
PHYS 211G & 211GL	General Physics I and General Physics I Laboratory (Math Teaching Field)	
PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory (Math Teaching Field)	
Choose one from the following courses		4
PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	
PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	
<i>Area IV Social/Behavioral Sciences</i>		
C EP 110G	Human Growth and Behavior	3
Choose from the following courses		3
ECON 201G	Introduction to Economics	
ECON 251G	Principles of Macroeconomics	
ECON 252G	Principles of Microeconomics	
Choose from the following courses		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
GEOG 112G	World Regional Geography	
GOVT 100G	American National Government	
GOVT 110G	Introduction to Political Science	
GOVT 150G	American Political Issues	
GOVT 160G	International Political Issues	
SOC 101G or SOC 201G	Introductory Sociology Contemporary Social Problems	

<i>Area V Humanities and Fine Arts</i>		
HIST 101G	Roots of Modern Europe	3
or HIST 102G	Modern Europe	
HIST 201G	Introduction to Early American History	3
or HIST 202G	Introduction to Recent American History	
Choose one from the following courses		3
ART 101G	Orientation in Art	
DANC 101G	Dance Appreciation	
MUS 101G	An Introduction to Music	
THTR 101G	The World of Theatre	
<i>Viewing the Wider World (6 credits from two different colleges; 3 additional credits satisfied with teaching field/concentration)</i>		
LIB 311V	Information Literacy	3
<b>Secondary Education Core Requirements</b>		
EDUC 281	Introduction to Secondary Education and Youth <sup>1,3</sup>	3
SPED 350	Introduction to Special Education in a Diverse Society <sup>1</sup>	3
EDLT 368	Integrating Technology with Teaching (Pre/Co-requisite for admission to TEP)	3
EDUC 342	Sheltered English Instruction for the ESL Classroom <sup>2</sup>	3
EDUC 495	Directed Study Courses in Education (Secondary Data Literacy and Assessment) <sup>2</sup>	3
EDUC 462	Teaching Mathematics at the Middle and High School Level <sup>2,3</sup>	3
RDG 414	Content Area Literacy <sup>2</sup>	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society <sup>2</sup>	3
SPED 482	Student Teaching SPED <sup>2</sup>	12
<b>Special Education Requirements</b>		
SPED 459	Classroom Management for Diverse Learners (Prerequisite SPED 350)	3
SPED 463	Introduction to Assessment of Diverse Exceptional Learners (Prerequisite SPED 350)	3
SPED 406	High Incidence Disabilities in a Diverse Society <sup>2</sup>	3
SPED 407	Low Incidence Disabilities in a Diverse Society <sup>2</sup>	3
SPED 481	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 489) <sup>2,3,4</sup>	3
RDG 371	Instruction for Special Reading Needs <sup>2</sup>	3
EDUC 489	Topics (Dual License Practicum; Prerequisite EDUC 462) <sup>2,3,4</sup>	3
<b>Math Education Teaching Field/Concentration Requirements</b>		
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
C S 111	Computer Science Principles	4
E T 182	Digital Logic	3
MATH 279	Introduction to Higher Mathematics	3

MATH 280	Introduction to Linear Algebra	3
STAT 371	Statistics for Engineers and Scientists I	3
or A ST 311	Statistical Applications	
MATH elective numbered 300+		3
MATH elective numbered 300+		3
MATH or A ST elective numbered 300+		3
<b>Total Credits</b>		<b>132</b>

- <sup>1</sup> Prerequisite for admission to Teacher Preparation Program (TEP)
- <sup>2</sup> Course requires admission to Teacher Education Program (TEP)
- <sup>3</sup> Course requires field experience
- <sup>4</sup> SPED 481 requires minimum of 90 practicum hours; EDUC 489 requires a minimum of 100 practicum hours

## Special Education Secondary Education (Science)

### GENERAL EDUCATION REQUIREMENTS

<i>Area I English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition <sup>1</sup>	4
Choose one from the following courses		3
ENGL 211G	Writing in the Humanities and Social Sciences <sup>1</sup>	
ENGL 311G	Advanced Composition <sup>1</sup>	
ENGL 318G	Advanced Technical and Professional Communication <sup>1</sup>	
Choose one from the following courses		3
COMM 253G	Public Speaking	
or COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II Mathematics</i>		
MATH 121G	College Algebra <sup>1</sup>	3
or MATH 190G	Trigonometry and Precalculus	
MATH 142G	Calculus for the Biological and Management Sciences	3
or MATH 191G	Calculus and Analytic Geometry I	
MATH 192G, MATH 291G or A ST 311 are acceptable substitutes		
<i>Area III Laboratory Sciences (Met with Science Teaching Field/Concentration)</i>		
<i>Area IV Social/Behavioral Sciences</i>		
C EP 110G	Human Growth and Behavior	3
GEOG 112G	World Regional Geography	3
Choose one from the following courses		3
ANTH 120G	Human Ancestors	
ANTH 125G	Introduction to World Cultures	
ANTH 201G	Introduction to Anthropology	
ANTH 202G	World Archaeology	
ANTH 203G	Introduction to Language and Cultural Anthropology	
SOC 101G	Introductory Sociology	
or SOC 201G	Contemporary Social Problems	
<i>Area V Humanities and Fine Arts</i>		

Choose one from the following courses	3	EDUC 342	Sheltered English Instruction for the ESL Classroom <sup>2</sup>	3
HIST 101G	Roots of Modern Europe	EDUC 495	Directed Study Courses in Education (Secondary Data Literacy and Assessment) <sup>2</sup>	3
HIST 102G	Modern Europe	EDUC 463	Teaching Science at the Middle and High School Level <sup>2,3</sup>	3
HIST 110G	Making History	RDG 414	Content Area Literacy <sup>2</sup>	3
HIST 111G	Global History to 1500	SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society <sup>2</sup>	3
HIST 112G	Global History Since 1500	SPED 482	Student Teaching SPED <sup>2</sup>	12
HIST 201G	Introduction to Early American History	<b>Special Education Core Requirements</b>		
HIST 202G	Introduction to Recent American History	SPED 459	Classroom Management for Diverse Learners (Prerequisite SPED 350)	3
HIST 211G	East Asia to 1600	SPED 463	Introduction to Assessment of Diverse Exceptional Learners (Prerequisite SPED 350)	3
HIST 212G	East Asia since 1600	SPED 406	High Incidence Disabilities in a Diverse Society <sup>2</sup>	3
HIST 221G	Islamic Civilizations to 1800	SPED 407	Low Incidence Disabilities in a Diverse Society <sup>2</sup>	3
HIST 222G	Islamic Civilizations since 1800	SPED 481	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 489) <sup>2,3,4</sup>	3
Choose two courses from two different subject areas	6	RDG 371	Instruction for Special Reading Needs <sup>2</sup>	3
ART 101G	Orientation in Art	EDUC 489	Topics (Dual License Practicum; Prerequisite EDUC 463) <sup>2,3,4</sup>	3
ART 110G	Visual Concepts	<b>Science Education Teaching Field/Concentration Requirements</b>		
ART 295G	Introduction to Art History I	BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	4
ART 296G	Introduction to Art History II	BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	4
DANC 101G	Dance Appreciation	CHEM 111G or CHEM 115	General Chemistry I or Principles of Chemistry I	4
ENGL 111GH	Rhetoric and Composition Honors	CHEM 112G	General Chemistry II	4
ENGL 115G	Perspectives on Literature	Choose one from the following courses		
ENGL 116G	Perspectives on Film	PHYS 211G & 211GL	General Physics I and General Physics I Laboratory	4
ENGL 203G	Business and Professional Communication	PHYS 213 & 213 L	Mechanics and Experimental Mechanics	4
ENGL 218G	Technical and Scientific Communication	PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory	4
ENGL 220G	Introduction to Creative Writing	PHYS 221G & 221GL	General Physics for Life Sciences I and Laboratory to General Physics for Life Science I	4
HIST 302V	Science in Modern Society	Choose one from the following courses		
HIST 311V	Colonial Latin America	PHYS 212G & 212GL	General Physics II and General Physics II Laboratory	4
HIST 312V	Modern Latin America	PHYS 214 & 214 L	Electricity and Magnetism and Electricity and Magnetism Laboratory	4
HIST 330V	Introduction to Religious Studies	PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	4
HIST 374V	The European City: History and Culture			
HIST 382V	Modern Russia			
HIST 390V	The Holocaust			
MUS 101G	An Introduction to Music			
MUS 201G	History of Jazz in Popular Music: A Blending of Cultures			
PHIL 100G	Philosophy, Law and Ethics			
PHIL 101G	The Art of Wondering			
PHIL 124G	Philosophy of Music			
PHIL 136G	The Quest for God			
PHIL 201G	Introduction to Philosophy			
PHIL 211G	Informal Logic			
PHIL 223G	Ethics			
THTR 101G	The World of Theatre			
<i>Viewing the Wider World (6 credits from two different colleges; 3 additional credits satisfied with teaching field/concentration)</i>				
LIB 311V	Information Literacy	3		
<b>Secondary Education Core Requirements</b>				
EDUC 281	Introduction to Secondary Education and Youth <sup>1,3</sup>	3		
SPED 350	Introduction to Special Education in a Diverse Society <sup>1</sup>	3		
EDLT 368	Integrating Technology with Teaching (Pre/Co-requisite for admission to TEP)	3		

PHYS 222G & 222GL	General Physics for Life Sciences II and Laboratory to General Physics for Life Sciences II	
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 467	Evolution	3
BIOL 300+ Plant Science Elective		3
Total Credits		130

<sup>1</sup> Prerequisite for admission to Teacher Preparation Program (TEP)

<sup>2</sup> Course requires admission to Teacher Education Program (TEP)

<sup>3</sup> Course requires field experience

<sup>4</sup> SPED 481 requires minimum of 90 practicum hours; EDUC 489 requires a minimum of 100 practicum hours

## Special Education Secondary Education (Social Studies)

### GENERAL EDUCATION REQUIREMENTS

<i>Area I English and Communication Arts</i>		
ENGL 111G	Rhetoric and Composition <sup>1</sup>	4
Choose one from the following courses		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 311G	Advanced Composition <sup>2</sup>	
or ENGL 318G	Advanced Technical and Professional Communication	
ENGL 318G	Advanced Technical and Professional Communication	
Choose one from the following courses		3
COMM 253G	Public Speaking	
or COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
<i>Area II Mathematics</i>		
MATH 121G	College Algebra <sup>1</sup>	3
or MATH 190G	Trigonometry and Precalculus	
MATH 210G	Mathematics Appreciation	3
or MATH 142G	Calculus for the Biological and Management Sciences	
<i>Area III Laboratory Sciences</i>		
Choose two from two different subject areas with labs		8
ASTR 105G	The Planets	
or ASTR 110G	Introduction to Astronomy	
BIOL 101G & 101GL	Human Biology and Human Biology Laboratory	
BIOL 110G	Contemporary Problems in Biology	
BIOL 111G & 111GL	Natural History of Life and Natural History of Life Laboratory	
BIOL 211G & 211GL	Cellular and Organismal Biology and Cellular and Organismal Biology Laboratory	
CHEM 110G	Principles and Applications of Chemistry	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	

GEOL 111G	Introductory Geology	
GEOL 212G	The Dynamic Earth	
GEOG 111G	Geography of the Natural Environment	
<i>Area IV Social/Behavioral Sciences</i>		
C EP 110G	Human Growth and Behavior	3
GEOG 120G	Culture and Environment	3
GOVT 100G	American National Government	3
or GOVT 110G	Introduction to Political Science	
<i>Area V Humanities and Fine Arts</i>		
ANTH 120G	Human Ancestors	
HIST 111G	Global History to 1500	3
or HIST 112G	Global History Since 1500	
HIST 211G	East Asia to 1600	3
or HIST 212G	East Asia since 1600	
HIST 221G	Islamic Civilizations to 1800	3
or HIST 222G	Islamic Civilizations since 1800	
Viewing the Wider World (6 credits from two different colleges; 3 additional credits satisfied with teaching field/concentration)		
LIB 311V	Information Literacy	3
<b>Secondary Education Core Requirements</b>		
EDUC 281	Introduction to Secondary Education and Youth <sup>1,3</sup>	3
SPED 350	Introduction to Special Education in a Diverse Society <sup>1</sup>	3
EDLT 368	Integrating Technology with Teaching (Pre/Co-requisite for TEP admission)	3
EDUC 342	Sheltered English Instruction for the ESL Classroom <sup>2</sup>	3
EDUC 495	Directed Study Courses in Education (Secondary Data Literacy and Assessment) <sup>2</sup>	3
EDUC 461	Teaching Social Studies at the Middle and High School Level	3
RDG 414	Content Area Literacy <sup>2</sup>	3
SPED 480	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society <sup>2</sup>	3
SPED 482	Student Teaching SPED <sup>2</sup>	12
<b>Special Education Core Requirements</b>		
SPED 459	Classroom Management for Diverse Learners (Prerequisite SPED 350)	3
SPED 463	Introduction to Assessment of Diverse Exceptional Learners (Prerequisite SPED 350)	3
SPED 406	High Incidence Disabilities in a Diverse Society <sup>2</sup>	3
SPED 407	Low Incidence Disabilities in a Diverse Society	3
SPED 481	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 489) <sup>2, 3, 4</sup>	3
RDG 371	Instruction for Special Reading Needs <sup>2</sup>	3
EDUC 489	Topics (Dual License Practicum; Prerequisite EDUC 461) <sup>2, 3, 4</sup>	3

Social Studies Teaching Field/Concentration Requirements		
ECON 251G	Principles of Macroeconomics	3
ECON 252G	Principles of Microeconomics	3
GEOG 281	Map Use: Reading, Analysis and Interpretation	3
HIST 101G or HIST 102G	Roots of Modern Europe Modern Europe	3
HIST 201G	Introduction to Early American History	3
HIST 202G	Introduction to Recent American History	3
HIST 368	Teaching History	3
HIST 386	New Mexico History <sup>5</sup>	3
HIST Elective 300+		3
GOVT, ECON, GEOG, or HIST Elective 300+		3
Total Credits		132

<sup>1</sup> Prerequisite for admission to Teacher Preparation Program (TEP)

<sup>2</sup> Course requires admission to Teacher Education Program (TEP)

<sup>3</sup> Course requires field experience

<sup>4</sup> SPED 481 requires minimum of 90 practicum hours; EDUC 489 requires a minimum of 100 practicum hours

<sup>5</sup> Students who complete HIST 261 at another campus/university will need to take an additional 3 credit course at the 300+ level in ECON, GEOG, GOVT, or HIST to meet state licensure requirements.

## Communication Disorders - Master of Arts

Students entering the graduate program with an undergraduate major in Communication Disorders can expect to complete the program in two years and be awarded a Masters of Arts in Communication Disorders with a specialization in Speech-Language Pathology. The graduate program for students without a Communication Disorders background is generally one year longer because one year of leveling is required. Enrollment in graduate courses in Communication Disorders is limited to students who have been accepted into the graduate program in Communication Disorders. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria which are aligned with the requirements of state and national certifying bodies for licensure and clinical certification. Details regarding certification are available from the American Speech-Language-Hearing Association (<http://www.asha.org/certification>) (ASHA), and the New Mexico Regulations & Licensing Department ([http://www.rld.state.nm.us/boards/speech\\_language\\_pathology\\_audiology\\_and\\_hearing\\_aid\\_dispensing\\_practic](http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispensing_practic))

The Master's degree program in Speech-Language Pathology at New Mexico State University is accredited by the Council on Academic Accreditation (CAA) in Audiology and Speech-Language Pathology. Admission requirements and procedures can be found on the program website ([https://spedcd.nmsu.edu/cd/graduate\\_general\\_info/graduate\\_admission\\_info](https://spedcd.nmsu.edu/cd/graduate_general_info/graduate_admission_info)).

### Program Requirements

The traditional Master's degree plan requires a minimum of 54 graduate credit hours and the completion of at least 400 clinical hours.

C D 505	Research Methods	3
C D 523	Assessment of Communication Disorders	3

C D 525	Pediatric Language and Disorders	3
C D 542	Articulation and Phonological Disorders	3
C D 590	Clinical Education	2
C D 589	Practicum in Speech-Language Pathology	13
C D 535	Aphasia & Cognitive Linguistic Disorders	3
C D 586	Voice Disorders/Head and Neck Anomalies	3
C D 584	Fluency Disorders	3
C D 583	Dysphagia	3
C D 585	Motor Speech Disorders	3
C D 521	Professional Issues and Multicultural Practices in Communication Disorders	3
C D 640	Externship in Communication Disorders	6
Elective Course		
C D 547	Cognitive-Linguistic Communication Disorders	3
or C D 545	Introduction to Augmentative and Alternative Communication	
or C D 591	Special Topics	
Total Credits		54

### Bilingual Program

In addition to the traditional program of study, students with proficiency in English and Spanish may pursue the bilingual program in Speech-Language Pathology, which requires the following additional coursework:

C D 541	Advanced Spanish Morpho-Syntax for Education Professionals	3
C D 548	Best Practices in Bilingual/Multicultural Assessment for Practitioners	3
Course offered through UNM online (SHS 359)		3

### Leveling Program

The graduate courses to be taken during the leveling year for students without a Communication Disorders undergraduate degree are as follows:

C D 504	Speech and Language Disorders	3
C D 507	Audiology	3
C D 501	Phonetics	3
C D 502	Anatomy and Physiology of Speech Mechanisms	3
C D 506	Clinical Methods and Procedures	3
C D 510	Neural Bases of Communication Disorders	3
C D 508	Aural Rehabilitation	3
C D 503	Speech Science	3
C D 509	Language Acquisition	3

Total Credits 27

### Special Education - Master of Arts

Enrollment in graduate licensure program courses with field experiences in Special Education is limited to persons who have been accepted into the graduate program in Special Education. For other special education graduate courses, enrollment of students outside of the

special education program is contingent upon meeting prerequisites and availability after enrollment of Special Education graduate students. To complete a course of study, each student must meet the program's academic and field based competency criteria, including a grade of B or higher in each course in the program of study, satisfactory evaluation in field experiences for those seeking licensure, and a passing score on the MA Comprehensive Exam. The Master of Arts in Special Education has five pathways to meet the varied needs of students pursuing graduate education and can be completed in two years for full-time students.

## MA in Special Education Pathways

1. MA in Special Education (preparation for an initial license in Special Education). This route is 42 credits including student teaching and provides preparation for the New Mexico pre-K-12 Special Education license. Candidates must be admitted to the Teacher Education Program before completing practicum and student teaching experiences.
2. MA in Special Education (preparation for a second license, in Special Education, for students who already have an initial license in another area such as Early Childhood, Elementary, or Secondary Education). This route requires 30 credits of special education coursework and provides preparation for the New Mexico pre-K-12 Special Education license.
3. MA in Special Education (preparation using the Alternative Licensure process). This route includes 39 credits. It begins with completion of alternative licensure components, which includes 21 credits of state-approved coursework and two semesters of university supervision while concurrently employed as the special education teacher of record in a classroom. After completion of the alternative components, students complete the remaining coursework (18 credits) and degree requirements.
4. MA in Special Education (a Scholarly route for students who are not seeking licensure or who already have a license and are seeking additional depth of knowledge). This route requires 30 credits of special education coursework and does not lead to licensure.
5. MA in Special Education with an emphasis in Visual Impairment (preparation for licensure in teaching school-aged children/infants/toddlers and/or orientation and mobility). This route requires 30-36 credit hours in visual impairment and special education coursework. Students who meet qualifications and are interested in visual impairment may elect to pursue licensure only, rather than a master's degree, with 15-27 credits leading to a Blind and Visually Impaired Teaching License or National Certification in Orientation and Mobility.

## Admission

The Special Education Program has a "rolling admissions" procedure for MA programs. Applications are reviewed upon submission to determine if candidates meet admission requirements. Application requirements follow:

1. A completed Graduate School admission application.
2. A letter of interest explaining the applicant's goals in pursuing an MA in Special Education.
3. Complete transcripts of all college work, including notation of a BA or BS Degree and a cumulative GPA of a 3.0 or higher.

4. A curriculum vitae or resume.
5. Email addresses to contact three individuals who can provide a professional recommendation, such as professors, employers, or others qualified to evaluate potential for graduate work.
6. For alternative licensure, a letter from a school district indicating consideration for a position.
7. For international students with English language testing requirements, TOEFL test results of at least 79 iBT; 550 paper, or IELTS results of at least 6.5.

## Special Education - Doctor of Education

The Special Education Doctorate Program is committed to preparing professionals in the areas of teaching, research, service, and leadership positions. All students within this program are trained to conduct independent research, become critical/independent thinkers, and embrace the notion of diversity. Upon completion of the doctorate the student will be able to inform policies that promote the well-being of all individuals with exceptionalities at the local, community, societal, and global levels. The Department of Special Education/Communication Disorders is pleased to offer two different, but equally rigorous, pathways (a Ph.D. or an Ed.D.). The two degrees can be differentiated in this way: a potential candidate seeks to drive educational change through either the use of existing research (Ed.D.) or the creation of new research (Ph.D.). Additionally, there are two areas of specialization: Bilingual/Multicultural Special Education and Autism Spectrum Disorders. A student may also choose to minor in a related area such as Communication Disorders and must work carefully with an advisor to plan a program of study if a minor is desired.

## Admission

Doctoral admission is competitive. To maximize consideration for admittance, applications must be submitted by February 10 for admission in the following semester. Admissions decisions are made based on evaluation of the student's potential for success in research, teaching, and service to the profession. Requirements include the following.

1. Completed Graduate school admission application.
2. Letter of Intent that explains professional goals and area of research interest.
3. Complete transcripts from all post-secondary educational experiences, with notation of a bachelor's degree, a master's degree in a related field of study, and a minimum 3.0 cumulative GPA on a 4.0 scale.
4. Scores from the Graduate Record Examination.
5. Curriculum vitae or resume.
6. Email addresses by which the graduate school application system will contact three individuals who can provide letters of professional recommendation.
7. Scholarly Writing Sample (10-15 scholarly paper following APA guidelines about a current issue in the field of Special Education).

8. A letter of support from a faculty member indicating an interest in fulfilling the role of advisor.

9. For international students with English language testing requirements, TOEFL results of at least 79 IBT; 550 PBT or IELTS scores of at least 6.5.

## Coursework

60 credit hours (42 credit hours in coursework and 18 credits of dissertation research) is the minimum credit hours required for either a Ph.D. or Ed.D. The required coursework is planned with the student's committee members who take into account the student's research interest, research design, availability of coursework, and independent research study(s) which occur under the direction of the advisor of record and/or a faculty member. Additional coursework is contingent and may be recommended by the Doctoral Qualifying Committee, the advisor of record, and the student. Coursework requirements follow:

<b>Required Core Coursework</b>		12
SPED 523	Advanced Curriculum for Diverse Exceptional Learners	3
SPED 610	Current Issues in Special Education for Teaching in a Culturally Responsive Society	
SPED 613	Current Research in Special Education	
SPED 606	High Incidence Disabilities in a Diverse Society	
or SPED 607	Low Incidence Disabilities	
<b>Research Sequence (3 credits must be statistics based)</b>		9+
<b>Area of Research Interest (individually based on the student area of interest)</b>		18+
<b>Dissertation</b>		18+

## Examinations

Students must pass a qualifying examination (during the first year of study), a Comprehensive Exam including written electronic portfolio and oral elements (prior to beginning a dissertation), and a final dissertation defense. The doctoral handbook on the departmental website provides procedural and other details regarding each exam.

## Dissertation

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

# Special Education - Doctor of Philosophy

The Special Education Doctorate Program is committed to preparing professionals in the areas of teaching, research, service, and leadership positions. All students within this program are trained to conduct independent research, become critical/independent thinkers, and embrace the notion of diversity. Upon completion of the doctorate the student will be able to inform policies that promote the well-being of all individuals with exceptionalities at the local, community, societal, and

global levels. The Department of Special Education/Communication Disorders is pleased to offer two different, but equally rigorous, pathways (a Ph.D. or an Ed.D.). The two degrees can be differentiated in this way: a potential candidate seeks to drive educational change through either the use of existing research (Ed.D.) or the creation of new research (Ph.D.). Additionally, there are two areas of specialization: Bilingual/Multicultural Special Education and Autism Spectrum Disorders. A student may also choose to minor in a related area such as Communication Disorders and must work carefully with an advisor to plan a program of study if a minor is desired.

## Admission

Doctoral admission is competitive. To maximize consideration for admittance, applications must be submitted by February 10 for admission in the following semester. Admissions decisions are made based on evaluation of the student's potential for success in research, teaching, and service to the profession. Requirements include the following:

1. Completed Graduate school admission application.
2. Letter of Intent that explains professional goals and area of research interest.
3. Complete transcripts from all post-secondary educational experiences, with notation of a bachelor's degree, a master's degree in a related field of study, and a minimum 3.0 cumulative GPA on a 4.0 scale.
4. Scores from the Graduate Record Examination.
5. Curriculum vitae or resume that includes at least 3 years prior (or continuing concurrent) direct and/or related teaching experience in an educational field.
6. Email addresses by which the graduate school application system will contact three individuals who can provide letters of professional recommendation.
7. Scholarly Writing Sample (10-15 page scholarly paper following APA guidelines about a current issue in the field of Special Education).
8. A letter of support from a faculty member indicating an interest in fulfilling the role of advisor.
9. For international students with English language testing requirements, TOEFL results of at least 79 IBT; 550 PBT or IELTS scores of at least 6.5.

## Coursework

60 credit hours (42 credit hours in coursework and 18 credits of dissertation research) are the minimum credit hours required for either a Ph.D. or Ed.D. The required coursework is planned with the student's committee members who take into account the student's research interest, research design, availability of coursework, and independent research study(s) which occur under the direction of the advisor of record and/or a faculty member. Additional coursework is contingent and may be recommended by the Doctoral Qualifying Committee, the advisor of record, and the student. Coursework requirements follow:

<b>Required core coursework:</b>		12
SPED 523	Advanced Curriculum for Diverse Exceptional Learners	

SPED 610	Current Issues in Special Education for Teaching in a Culturally Responsive Society	
SPED 613	Current Research in Special Education	
SPED 606	High Incidence Disabilities in a Diverse Society	
or SPED 607	Low Incidence Disabilities	
<b>Research Sequence (9 credits in quantitative research design/statistics based)</b>		<b>12+</b>
<b>Area of Research Interest (individually based on the student's area of interest)</b>		<b>18+</b>
<b>Dissertation</b>		<b>18+</b>

## Examinations

Students must pass a qualifying examination (during the first year of study), a Comprehensive Exam including written portfolio and oral elements (prior to beginning a dissertation), and a final dissertation defense. The doctoral handbook on the departmental website provides procedural and other details regarding each exam.

## Dissertation

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

## Special Education - Graduate Minor

A minor in special education requires 9 credits of graduate coursework that carries the SPED prefix. Official minor documentation must be completed with the Department of Special Education and Communication Disorders.

# COLLEGE OF ENGINEERING

Dean - *Lakshmi Reddi, P.E.*

Associate Dean (Academic Programs) - *Sonya Cooper, P.E.*

Associate Dean/Director of Engineering Research Center - *Phillip DeLeon*

Associate Dean (Outreach) - *Patricia Sullivan*

Business Manager - *Monica Lopez*

Communications and Special Events coordinator - *Linda Fresques*

Student Programs Coordinator - *Elizabeth Howard*

The College of Engineering comprises six departments:

- Chemical Engineering (p. 558);
- Civil Engineering (p. 570);
- Electrical and Computer Engineering (p. 580);
- Engineering Technology and Surveying Engineering (p. 605);
- Industrial Engineering (p. 623);
- Mechanical and Aerospace Engineering (p. 629).

## Mission of the College of Engineering

The College of Engineering will uphold the land grant mission of NMSU through nationally recognized programs in education, research and professional & public service.

With respect to our undergraduate programs, we will accomplish our mission by focusing on the following goals:

1. To be nationally and internationally recognized for academic & research programs in Engineering & Engineering Technology.
2. Provide world-class engineers & engineering technologists for industrial, government, and academic constituents of the College of Engineering
3. To be the University of Choice for undergraduate engineering & engineering technology education in the region
4. To serve as an engine for economic development in New Mexico through the advancement of engineering and technology

Furthermore, graduates receiving baccalaureate degrees will demonstrate:

- an ability to apply knowledge of mathematics, science and engineering;
- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component or process to meet desired needs;
- an ability to function on multi-disciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- a recognition of the need for, and an ability to engage in life-long learning;

- a knowledge of contemporary issues; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## Undergraduate Student Advisement

Starting with the Fall 2017 semester, students entering the College of Engineering will be advised by the Center for Academic Advising and Student Support (CAASS) located in Garcia Annex. Students may also change majors at the CAASS. Students uncertain about choosing a major may list themselves as undeclared in the College of Engineering and be advised by the CAASS. Undeclared students will be asked to choose a major after two semesters in the college. Students must have a declared major in order to graduate.

At the discretion of the associate dean, students who do not demonstrate satisfactory progress may be required to leave the College of Engineering.

## Undergraduate General Education

With the exception of math and science, the College accepts all coursework approved for inclusion in the New Mexico General Education Common Core. Calculus I, General Chemistry I and Engineering Physics I are required to satisfy areas II and III of the common core.

## S/U Coursework

The College requires most degree requirements to be taken with traditional grading. Students may take selected humanities and social science courses under the S/U option. Other exceptions are specifically noted in the program descriptions later in this catalog.

## Undergraduate Math Placement

Entering freshmen are placed into an appropriate math course based upon the results of the Math Placement Exam administered regularly by the NMSU mathematics department. Students with Advanced Placement or transfer credit for mathematics will be placed accordingly. Math placement may be altered at the discretion of the associate dean.

## Minors

Minors are available from most departments within the College of Engineering are outlined in the individual program descriptions.

## Undergraduate Cooperative Education

After two semesters of satisfactory academic work (2.5 GPA), an engineering student may go on a work phase with one of the many companies or governmental agencies with which the university has co-op agreements. The experience obtained through alternating periods of academic and fieldwork greatly contributes to the preparation of a student for professional life. Work phases are considered to be a vital part of the educational process, and students are counseled in the selection of co-op positions that will lead to progressive learning experiences. Earnings while on work phase provide a source of financial assistance to meet educational expenses.

A significant number of undergraduate engineering students are in the cooperative education program. Students may, with the approval of their department head, earn credit while participating in a co-op work phase. Co-op credits do not normally count toward the degree requirements but do show on the transcript.

## Undergraduate General Academic Requirements

For regular admission to the University and the College of Engineering, incoming freshman and transfer applicants must meet the University's qualifications for regular admission as stated in the undergraduate catalog in effect at the time of application. Students admitted to the College of Engineering will be classified by the college as a Pre-[major] until the standard requirements described below for admission to the program major are met.

Pre-[major] students will be admitted into their respective programs once they have met the following criteria:

- Earn a minimum grade of C- in all of the following courses:
 

CHEM 111G	General Chemistry I	4
or CHEM 110 (engineering technology)		
SPCD 111G	Advanced ESL Composition	4
ENGR 100	Introduction to Engineering	3
MATH 191G	Calculus and Analytic Geometry I	4
or MATH 235 (engineering technology)		
PHYS 213	Mechanics	3
or PHYS 215G Engineering Physics I		
or PHYS 211 (engineering technology)		

Any of the above courses with earned AP credit (minimum score of 3) is exempt from the list. Transfer students may meet this criteria with determined passing credit of equivalent courses. PRE [major] students will be advised by their EG [major] department.

NMSU College of Engineering reserves the right to independently test any student's English proficiency upon arrival, including those who have earned scores satisfying minimum admission criteria. If the demonstrated level of English proficiency is not sufficient for academic success as determined by the Center for English Language Programs, support classes may be required to improve proficiency.

Students must earn a minimum cumulative GPA of 2.0 before enrolling in engineering courses numbered 300 or above.

Students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree and also courses taken to satisfy the general education requirements for Area I-Communications, Area II-Mathematics/Algebra, and Area III-Laboratory Science. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately during the next semester it is offered. An undergraduate student may attempt an engineering, math, or physical science course no more than three times to earn a passing grade of C- or better. Anytime a student earns less than a C-, a meeting with the appropriate Engineering academic advisor is required to develop a plan for addressing this issue. If the student fails to pass any of these courses after three attempts, then the student will not be able to continue as an Engineering major and will be counseled on other degree options.

## Engineering Transfer Policy

Policy for engineering majors enrolling in courses at other institutions to meet College of Engineering Departmental Core Requirements<sup>1</sup>.

1. NMSU Policy Manual Chapter 6, section 89, paragraph A. "The decision to award a student credit for work completed at another institution rests with the faculty."
2. NMSU main campus engineering majors may take core classes at other institutions of higher education to meet NMSU College of Engineering Departmental Core if the NMSU core course cannot accommodate any more eligible students.
3. The following conditions and restrictions apply to any course not taken on the NMSU main campus.
  - The department must approve the course prior to enrollment (student to provide course syllabus and any other documentation to department head).
  - The course must be a class in a program that is accredited by an accreditation commission of ABET, Inc. and cannot be graded S/U
  - The course must be substantially the same as the equivalent NMSU class and the student must have satisfied all NMSU prerequisite requirements.
  - The student shall provide a corresponding course syllabus and any other documentation required.
  - If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.
4. In addition to 3 above, the following conditions apply to any on-line course not taken from the NMSU main campus.
  - Scheduled exams, if any, shall be proctored<sup>2</sup>.
  - If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.

<sup>1</sup> Core requirements are defined as required departmental, discipline-related, courses within the major.

<sup>2</sup> The student may choose to have NMSU proctor Exams (<http://distance.nmsu.edu/faculty/requiring-a-proctored-exam/>)

**For more information about transferring to New Mexico State University from another accredited institution, visit the NMSU Transfer Center.**

## Requirements for Graduation

The minimum requirements for undergraduate degrees are:

1. Satisfaction of the university requirements as previously outlined in the Regulations (p. 53) section of this catalog.
2. Satisfaction of the college requirements as outlined under General Academic Requirements, above.
3. Satisfaction of the departmental rules and course requirements as outlined in the individual program descriptions.

*NOTE: In order to maintain quality, remain current, and satisfy changes in accreditation criteria, requirements which have been published may be changed. Any such changes will be announced and will not be retroactive. Always consult an academic advisor before registering for classes.*

## Graduate Degrees

Graduate study is available in the

- Aerospace Engineering (p. 629),
- Chemical Engineering (p. 558),
- Civil Engineering (p. 570),

- Electrical Engineering (p. 580),
- Environmental Engineering (p. 570),
- Industrial Engineering (p. 623) and
- Mechanical Engineering (p. 629).

See individual program descriptions for graduate degree requirements.

## Bachelor Degrees

Bachelor of Information and Communication Technology (p. 620)

### Bachelor of Science in Engineering

#### Majors in:

- Aerospace Engineering (p. 635)
- Chemical Engineering (p. 566)
- Civil Engineering (p. 575)
- Electrical Engineering (p. 590)
- Engineering Physics (p. 601)
- Engineering Technology (p. 606)
- Geomatics (p. 619)
- Industrial Engineering (p. 627)
- Mechanical Engineering (p. 637)

## Dual Degrees

Bachelor of Science/ Master of Science-Electrical Engineering

## Masters Degree

Master of Science in Aerospace Engineering (p. 639)

Master of Science in Chemical Engineering

Master of Science in Civil Engineering

- Geotechnical Engineering
- Structural Engineering
- Water Resource Engineering

Master of Science in Electrical Engineering (p. 593)

Master of Science in Environmental Engineering

Master of Science in Industrial Engineering

Master of Science in Mechanical Engineering

## Doctoral Degree

Doctor of Philosophy

#### Majors in:

- Aerospace Engineering (p. 640)
- Chemical Engineering (p. 569)
- Electrical Engineering (p. 594)
- Engineering
  - Civil Engineering (p. 570)
  - Industrial Engineering (p. 628)
  - Mechanical Engineering (p. 641)

## Undergraduate Minors

- Aerospace Engineering (p. 638)
- Agricultural Engineering (p. 577)
- Biomedical Engineering (p. 567)
- Brewery Engineering (p. 567)
- Computational Engineering (p. 567)
- Computer Engineering (p. 593)
- Digital Electronic Applications (p. 621)
- Digital Forensics (p. 621)
- Electrical Engineering (p. 593)
- Entrepreneurship (p. 628)
- Geomatics (p. 621)
- Information Security Technology (p. 622)
- Manufacturing (p. 622)
- Materials Engineering (p. 567)
- Mechanical Engineering (p. 639)
- Nuclear Chemical Engineering (p. 568)
- Pre-Law in Intellectual Property
- Pre-Medicine Studies (p. 568)
- Renewable Energy Technologies (p. 622)

## Graduate Minor

- Materials Engineering (p. 569)

## Accreditation

ABET (formerly the Accreditation Board for Engineering and Technology), established in 1933 and composed of representatives from technical societies, assures professional standards by periodic evaluations of the programs in the College of Engineering. (ABET may be contacted at <http://www.abet.org>)

Continuous accreditation by the Engineering Accreditation Commission (EAC) of ABET has been in force since

- 1938 for civil, electrical, and mechanical engineering,
- 1967 for chemical engineering,
- 1971 for industrial engineering,
- 2001 for surveying engineering and
- 2005 for engineering physics.

The electronics and computer, civil, and mechanical engineering technology baccalaureate degree programs have been accredited by the Technology Accreditation Commission (TAC) of ABET since 1988.

The college is a member of the American Society for Engineering Education (ASEE).

## Chemical & Materials Engineering

### Mission

The New Mexico State University Chemical & Materials Engineering Department strives to prepare Chemical Engineering Bachelor of Science graduates to successfully and safely practice the chemical engineering profession, to engage in life-long personal and professional development, and to contribute to the betterment of their community and society.

## Undergraduate Program Information

Chemical engineers solve problems by combining the fundamentals of physical science (chemistry and physics) and life science (biology, microbiology, biochemistry) with the principles of engineering analysis, mathematics, and economics. The curriculum of study leading to the BSChE continuously builds on prerequisite knowledge. The capstone course requires completion of a series of seven prerequisite courses, each having its own prerequisites. In this manner, the BSChE produces graduates with highly developed problem-solving capabilities, strong communication and interpersonal skills, and an ability to seek out and assimilate knowledge beyond the classroom. Graduates apply these competencies to solve problems across a wide range of industries in the private and public sectors.

The work of a chemical engineer typically leads to the development of processes that convert raw materials (chemicals) into more useful or valuable products. Chemical engineers are pioneers of modern materials and associated processes that are essential to the fields of:

- nanotechnology;
- fuel cells;
- computer chip manufacture;
- environmental restoration and pollution prevention;
- biomedical, biotechnology and bioengineering;
- pharmaceutical manufacturing;
- food production;
- transportation (automotive and aerospace);
- advanced materials;
- petrochemical and refining;
- chemical synthesis and production; and
- power & energy (including the nuclear industry).

Graduates are also well-prepared to continue the study of law, medicine or advanced engineering topics at the graduate level.

### Undergraduate Program Educational Objectives

The Chemical & Materials Engineering Department at New Mexico State University strives to produce undergraduates who will:

1. apply their problem-solving and communication skills to chemical engineering industries, government research labs, academia, and related fields;
2. implement safety practices in their work;
3. be on the path to leadership; and
4. build new skills sets through continuing education and professional development.

These Program Educational Objectives (PEOs), which are modified based on input from our constituencies, are consistent with the missions of NMSU, the College of Engineering and the Department of Chemical & Materials Engineering.

## Graduate Program Information

The Department of Chemical and Materials Engineering offers graduate study leading to the Master of Science degree and the Ph. D. with an emphasis in chemical engineering. Admission to the program is in accord with the general regulations of the Graduate School. The Graduate

Record Examination (GRE) General Test is required for all applicants. All graduate students are required to pass all graduate engineering courses with a minimum grade of B-.

All graduate students must select a thesis or dissertation advisor by the end of their first year in the chemical engineering graduate program. Thesis/dissertation may be pursued in absentia at various industrial sites by special arrangement.

Graduate teaching and research assistantships, fellowships and traineeships are available. For consideration for financial assistance, completed applicants must be received by March 1. All support is contingent upon availability, eligibility and satisfactory progress toward the degree.

Each student admitted to the CHME grad program who has an undergraduate degree in a discipline other than chemical engineering must schedule a meeting with the CHME Department Head to define the undergraduate course deficiencies the student must take to obtain a graduate degree in chemical engineering.

### Graduate Program Educational Objectives

The Chemical & Materials Engineering Department at New Mexico State University strives to produce graduate students who will:

1. design research studies to solve complex engineering problems using engineering and science fundamentals combined with statistics and economic principles to justify their technical recommendations;
2. apply their engineering knowledge to critically evaluate relevant literature and emerging technologies;
3. work independently and collaboratively;
4. apply professional and ethical responsibilities of the engineering profession;
5. evaluate the impact of their work on society;
6. effectively present engineering results in both written and oral formats; and
7. serve as effective leaders of their peers.

## Degrees for the Department

Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 566)

Chemical Engineering - Master of Science in Chemical Engineering (p. 568)

Chemical Engineering - Doctor of Philosophy (p. 569)

## Minors for the Department

Brewery Engineering - Undergraduate Minor (p. 567)

Biomedical Engineering - Undergraduate Minor (p. 567)

Computational Engineering - Undergraduate Minor (p. 567)

Materials Engineering - Undergraduate Minor (p. 568)

Nuclear Chemical Engineering - Undergraduate Minor (p. 568)

Pre-Law in Intellectual Property - Undergraduate Minor

Pre-Medicine Studies - Undergraduate Minor (p. 568)

Materials Engineering - Graduate Minor (p. 569)

**Professor, David A. Rockstraw<sup>1</sup>, Department Head**

**Professor, Martha C. Mitchell<sup>1</sup>, Associate Department Head**

**Professors** Mitchell<sup>1</sup>, Rockstraw<sup>1</sup>; **Associate Professors**

Andersen, Houston, Luo; **Assistant Professors** Brewer, Foudazi, Jena, Manz, Zhou; **Emeritus Professors** Bhada, Ghassemi, Johnson, Long, Patton

**Professors:** M.C. Mitchell<sup>1</sup>, Ph.D. (Minnesota) computer modeling and simulation of molecular-level phenomena, thermodynamic characterization of aerospace fuels, statistical mechanics, engineering education, diversity and inclusion in STEM; D.A. Rockstraw<sup>1</sup>, Department Head, Ph.D. (Oklahoma) chemical process design, analysis & simulation, catalysis and reaction kinetics, activated carbon, trade secret and intellectual property litigation; **Associate Professors:** P.K. Andersen, Ph.D. (California-Berkeley) physicochemical hydrodynamics, nuclear chemical engineering, modeling and simulation, education and training; J. Houston, Ph.D. (Texas A&M) biomedical engineering, biophotonics, flow cytometry; H. Luo, Ph.D. (Tulane) nanostructured materials, thin films, photovoltaics, batteries, electrocatalysts, photocatalysts; **Assistant Professors:** C.E. Brewer, Ph.D. (Iowa State) biomass thermochemical processing, sustainable agriculture, biorenewable resources, brewery engineering; R. Foudazi, Ph.D. (Cape Peninsula University of Technology, South Africa) soft matter, membranes, rheology of complex fluids, colloid and interface science, adsorption; U. Jena, Ph. D. (Georgia) biological and agricultural engineering; biosystems engineering, hydrothermal processing of biomass; catalysis, biofuel characterization and analysis; T.A. Manz, Ph.D. (Purdue) quantum chemistry simulations of materials, catalysis, and space physics; M. Zhou, Ph.D. (New Mexico State) gas adsorption and separation, energy storage devices, capacitive deionization.

<sup>1</sup> Registered Professional Engineer

## Chemical Engineering Courses

### CHME 101. Introduction to Chemical Engineering Calculations

#### 2 Credits

Introduction to the discipline of chemical engineering, including: an overview of the curriculum; career opportunities; units and conversions; process variables; basic data treatments; and computing techniques including computer programming and use of spreadsheets.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Restricted to Las Cruces campus only.

### CHME 102. Material Balances

#### 2 Credits

Perform material balances in single- and multi-phase, reacting and non-reacting systems under isothermal conditions.

**Prerequisite(s)/Corequisite(s):** CHEM 111G or CHEM 115. Prerequisite(s): MATH 190G, CHME 101.

### CHME 201. Energy Balances & Basic Thermodynamics

#### 3 Credits

Chemical Engineering energy balances; combined energy and material balances including those with chemical reaction, purge and recycle; thermochemistry; application to unit operations. Introduction to the first and second laws of thermodynamics and their applications. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** CHME 102, CHEM 115 or CHEM 111G, and MATH 192G.

### CHME 301. Chemical Engineering Thermodynamics I

#### 3 Credits

Applications of the first and second law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances.

**Prerequisite(s)/Corequisite(s):** CHME 392 or MATH 392. Prerequisite(s): CHME 201, MATH 291G. Restricted to: CHME majors.

### CHME 302. Chemical Engineering Thermodynamics II

#### 2 Credits

Continuation of CHME 301. Restricted to: CHME majors.

**Prerequisite(s):** CHME 301 AND (CHME 392 OR MATH 392).

### CHME 302 L. Thermodynamic Models of Physical Properties

#### 1 Credit

Computational analysis of thermodynamic models in a chemical process simulator, and comparison to experimental data. Specification of pseudo-components. Generation of physical properties by group contribution methods.

**Prerequisite(s)/Corequisite(s):** CHME 302.

### CHME 303. Chemical Engineering Thermodynamics

#### 4 Credits

Applications of the First Law and Second Law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances. Modeling of physical properties for use in energy and entropy balances, heat and mass transfer, separations, reactor design, and process control. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): CHME 201, MATH 291.

### CHME 305. Transport Operations I: Fluid Flow

#### 3 Credits

Theory of momentum transport. Unified treatment via equations of change. Shell balance solution to 1-D problems in viscous flow. Analysis of chemical engineering unit operations involving fluid flow. General design and operation of fluid flow equipment and piping networks.

**Prerequisite(s)/Corequisite(s):** CHME 392. Prerequisite(s): CHME 201, PHYS 215G, MATH 291G. Restricted to: CHME majors.

### CHME 306. Transport Operations II: Heat and Mass Transfer

#### 4 Credits

Theory of heat and mass transport. Unified treatment via equations of change. Analogies between heat and mass transfer. Shell balance solution to 1-D problems in heat and mass transfer. Analysis of chemical engineering unit operations involving heat transfer. Design principles for mass transfer equipment. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 305 and (CHME 392 or MATH 392).

### CHME 307. Transport Operations III: Staged Operations

#### 3 Credits

Theory of mass transport. Mass transfer coefficients. Analysis of chemical engineering unit operations involving mass transfer and separations. Equilibrium stage concept. General design and operation of mass-transfer equipment and separation sequences. Restricted to: CHME majors.

**Prerequisite(s):** CHME 302, CHME 306.

**CHME 311. Engineering Data Analysis****3 Credits**

Methodology and techniques associated with analyzing engineering data. Extensive spreadsheet use to analyze data and develop statistically significant conclusions based on the data. Data sets range from single variable experiments to multifactor regression analysis.

**Prerequisite(s):** MATH 192.

**CHME 323 L. Transport Operations and Instrumentation Laboratory I**  
**1 Credit**

Laboratory experiments demonstrate the principles of process measurement and instrumentation through the determination of thermodynamic properties, transport phenomena properties, heat transfer, and material physical properties. Treatment of data includes regression techniques, analysis of error, and statistical analysis.

**Prerequisite(s)/Corequisite(s):** CHME 306. Prerequisite(s): STAT 371 or CHME 311. Restricted to: CHME majors.

**CHME 324 L. Transport Operations and Instrumentation Laboratory II**  
**1 Credit**

Continuation of CHME 323L. Restricted to: CHME majors.

**Prerequisite(s):** CHME 323L.

**CHME 330. Environmental Management Seminar I**  
**1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 330, E E 330, E S 330, E T 330, I E 330, M E 330 and WERC 330

**CHME 352 L. Simulation of Unit Operations**  
**1 Credit**

Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover pipe networks, pressure changers, heat exchangers, distillation columns, and chemical reactors.

**Prerequisite(s)/Corequisite(s):** CHME 307, CHME 441. Restricted to: CHME majors.

**CHME 361. Engineering Materials**  
**3 Credits**

Bonding and crystal structure of simple materials. Electrical and mechanical properties of materials. Phase diagrams and heat treatment. Corrosion and environmental effects. Application of concepts to metal alloys, ceramics, polymers, and composites. Selection of materials for engineering design.

**Prerequisite(s):** (CHEM 111G or CHEM 114 or CHEM 115) and MATH 190G.

**CHME 391. Industrial Employment**  
**1-2 Credits**

Employment in chemical, petroleum, food, biotechnology, materials, environmental, pharmaceutical, or other industry relevant to the discipline, with opportunity for professional experience and training in chemical engineering. Requires written report covering work period approved by employer. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHME, CH E majors.

**Prerequisite(s):** Consent of department head.

**CHME 392. Numerical Methods in Engineering**  
**3 Credits**

Study and application of numerical methods in solving problems commonly encountered in engineering. The numerical methods are motivated by engineering problems rather than by mathematics. However, sufficient mathematical theory will be provided so that students can appreciate the insight into the techniques and their shortcomings of different methods. MATLAB will be used as the working environment for implementing and performing the numerical methods in computers. This course is an engineering elective open to all engineering majors. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 392.

**CHME 395V. Brewing Science and Society**  
**3 Credits**

An overview of the science of brewing and the interrelationships between society, technology, business, and the evolution of the current beer market. Topics covered are history of brewing and the interrelationships between societal attitudes, technology, and cultural preferences; beer styles and evaluation techniques; production and characteristics of ingredients used in brewing; brewing unit operations; biochemistry of malting, mashing, and fermentation; engineering in the brewery; homebrewing; and societal and health issues related to beer and alcohol. Students must be at least 21 years of age by the first day of instruction of the semester to enroll in this course.

**CHME 412. Process Dynamics and Control**  
**3 Credits**

Process modeling, dynamics, and feedback control. Linear control theory and simulation languages. Application of Laplace transforms and frequency response to the analysis of open-loop and closed-loop process dynamics. Dynamic response characteristics of processes. Stability analysis and gain/phase margins. Design and tuning of systems for control of level, flow, and temperature.

**Prerequisite(s):** CHME 441.

**CHME 423 L. Unit Operations Laboratory I**  
**1 Credit**

Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control system instrumentation and development of empirical models from process data. Includes written and oral reports. Restricted to: CHME majors.

**Prerequisite(s):** CHME 307, CHME 441, CHME 324L.

**CHME 424 L. Process Control Laboratory**  
**1 Credit**

Experiments with chemical engineering process control including the use of computer data acquisition and closed-loop process control. Covers control system instrumentation. Includes written and oral reports. Restricted to: CHME majors.

**Prerequisite(s):** CHME 412, CHME 423L.

**CHME 430. Environmental Management Seminar II**  
**1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 430, E E 430, E S 430, E T 430, I E 430, M E 430 and WERC 430

**CHME 441. Chemical Kinetics and Reactor Engineering****3 Credits**

Analysis and interpretation of kinetic data and catalytic phenomena. Applied reaction kinetics; ideal reactor modeling; non-ideal flow models. Mass transfer accompanied by chemical reaction. Application of basic engineering principles to design, operation, and analysis of industrial reactors.

**Prerequisite(s)/Corequisite(s):** CHME 307. Prerequisite(s): CHEM 313, CHME 302. Restricted to: CHME, CH E majors.

**CHME 443. Industrial Catalysis****3 Credits**

Fundamentals of catalytic processes, including chemistry, catalyst preparation, properties and reaction engineering. Addresses heterogeneous catalytic processes employed by industry. Detailed analysis of existing catalysts and catalytic reactions, and process design in chemical engineering.

**Prerequisite(s):** CHME 441.

**CHME 448. Industrial Safety****3 Credits**

An introduction to the fundamentals of chemical process safety, including toxicology, industrial hygiene, source models, fires and explosions, relief systems, hazard identification, risk assessment, environmental fate and transport, hazardous waste generation, pollution prevention, and regulatory requirements.

**Prerequisite(s):** CHEM 115 or CHEM 111G.

**CHME 449. Intellectual Property for Engineers and Scientists****3 Credits**

An overview of intellectual property with an emphasis on patents. Terminology, patentability requirements, invention disclosures, inventorship, scope of claims, patent application content and the patent prosecution process, and post-allowance matters including infringement and enforcement. Taught with CHME 549.

**Prerequisite(s):** CHEM 110G, CHEM 111G, or CHEM 115G; and senior standing in engineering or a fundamental science major; or consent of instructor.

**CHME 452. Chemical Process Design & Economic Evaluation****3 Credits**

Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 307, CHME 441.

**CHME 452 L. Chemical Process Simulation****1 Credit**

Construction and convergence of chemical processes in a process simulator. Students will understand how to access variables, define and converge design specifications and converge tear/recycle streams.

**Prerequisite(s)/Corequisite(s):** CHME 452. Prerequisite(s): CHME 352L. Restricted to: CHME majors.

**CHME 455. Chemical Plant Design****3 Credits**

Design and analysis of integrated process plants. Consideration given to optimizing performance, operability, reliability, safety, control, energy integration, and cost effectiveness. Requires written report covering solution of a capstone design problem. Restricted to: CHME majors.

**Prerequisite(s):** CHME 452.

**CHME 455 L. Chemical Plant Simulation****1 Credit**

Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control.

**Prerequisite(s)/Corequisite(s):** CHME 455. Prerequisite(s): CHME 412, CHME 452L. Restricted to: CHME majors.

**CHME 461. Calculation of Material and Molecular Properties****3 Credits**

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CHME 561.

**Prerequisite(s):** CHEM 116, MATH192G, (PHYS 214 or PHYS 216).

**CHME 462. MEMs, BioMEMs, and Nano Devices & Technologies****3 Credits**

Device-fabrication approaches and testing methodologies for micro-electro-mechanical (MEM) systems and nanoscale devices. Applications of such devices, and their working principles will also be part of this course. A laboratory component of this course will also be included. Taught with CHME 562. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** CH E 361, CHEM 111.

**CHME 463. Soft Matter****3 Credits**

Bulk soft matter assemblies including polymers, macromolecules, colloids, gels, vesicles, emulsions, surfactants, micelles, suspensions and liquid crystals. Self-assembly including molecular self-organization, supramolecular systems, encapsulation, self-assembled films and monolayers. Biological aspects of soft matter including biomacromolecules, cells and soft tissues. Surfaces, interfaces and interactions including thin films, Langmuir monolayers and wetting/dewetting. Physicochemistry and characterization of soft matter. Taught with CHME 563. Consent of Instructor required.

**Prerequisite(s):** CH E 302, CH E 305, CH E 361.

**CHME 464. Polymer Science & Engineering****3 Credits**

This course covers concepts in science and engineering of macromolecules, such as synthesis and chemistry, characterization of molecular weight, morphology, rheology, and mechanical behavior, structure and property relationships, and polymer processing. Taught with CHME 564. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 314.

**CHME 465. Rheology and Viscoelasticity****3 Credits**

Navier-Stokes equation; non-Newtonian fluids; flow fields; rheometry; viscoelastic models; non-linear viscoelasticity; material functions; complex fluids, including emulsions, suspensions and nanocomposites. Taught with CHME 565. Consent of Instructor required.

**Prerequisite(s):** CHME 306.

**CHME 467. Nanoscience and Nanotechnology****3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Taught with PHYS 520 and CH E 567. Crosslisted with: PHYS 520 and PHYS 467.

**Prerequisite(s):** (CHEM 116 or CHEM 112G), (PHYS 211G or PHYS 215G), (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard).

**CHME 468. Adsorption****3 Credits**

Introduction to adsorption science and technology, which includes adsorption equilibrium and kinetic theories, adsorbent materials and characterization, adsorption processes and design. Selected applications of adsorption processes in chemical and pharmaceutical industries and environmental protections will also be discussed. Taught with CHME 568. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 201.

**CHME 470. Introduction to Nuclear Energy****3 Credits**

Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology.

**Prerequisite(s):** CHEM 111G, MATH 192G.

**CHME 471. Health Physics****3 Credits**

Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis.

**Prerequisite(s):** MATH 192G, CHME 470.

**CHME 472. Detection Techniques for Radionuclides and Volatile Organic Compounds****3 Credits**

Basics of analytical techniques used to detect and quantify the presence of radionuclides, with focus on lung and whole-body counting by gamma-ray spectrometry and gas chromatography/mass spectrometry techniques. Course also covers sampling techniques, chain-of-custody methods, and includes hands-on instrument experience at the Carlsbad Environmental Monitoring & Research Center (CEMRC). Course fee required for travel to CEMRC.

**Prerequisite(s):** CHME 470.

**CHME 473. Nuclear Regulations and Compliance Practices****3 Credits**

Introduction, through the use of case studies, to the best technical compliance practices for regulations governing the siting, licensing, constructing, operating and decommissioning of nuclear fuel cycle facilities. Consent of Instructor required.

**Prerequisite(s):** MATH 191G, (CHEM 111G or CHEM 115), CHME 470.

**CHME 474. Power Plant Design****3 Credits**

Principles of electric power generation. Review of DC and AC systems, energy sources, and prime movers. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations.

**Prerequisite(s):** MATH 191G, CHEM 111G.

**CHME 475. Nuclear Reactor Theory****3 Credits**

An overview of the properties of nuclei, nuclear structure, radioactivity, nuclear reactions, fission, resonance reactions, moderation of neutrons, will be followed by mathematical treatment of the neutronics behavior of fission reactors, primarily from a theoretical, one-speed perspective. Criticality, fission product poisoning, reactivity control, reactor stability and introductory concepts in fuel management, slowing down and one-speed diffusion theory.

**Prerequisite(s):** (CHEM 112G or CHEM 116G) PHYS 215G, MATH 291G, CHME 470.

**CHME 476. Nuclear Fuel Cycles****3 Credits**

Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Consent of Instructor required.

**Prerequisite(s):** CHME 470.

**CHME 479. Corrosion and Degradation of Materials****3 Credits**

Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstructure on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories.

**Prerequisite(s):** CHME 361.

**CHME 481. Biomedical Engineering and Engineering Healthcare****3 Credits**

Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. Taught with CHME 581. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHEM 116G, CHME 201.

**CHME 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Taught with CHME 585. Crosslisted with: AGRO 485 and HORT 486.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**CHME 486. Biofuels****3 Credits**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** CHME 201.

**CHME 488. Elements of XRD****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: PHYS 468.

**Prerequisite(s)/Corequisite(s):** . Prerequisite(s): a C- or better in PHYS 315 and PHYS 315 L.

**CHME 489. Introduction to Modern Materials****3 Credits**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties. Crosslisted with: PHYS 489.

**Prerequisite(s):** PHYS 315 or engineering equivalent.

**CHME 490. Senior Seminar****1 Credit**

Research seminar attended by graduate students is open to CHME undergraduates who are research active May be repeated up to 2 credits.

**Prerequisite(s)/Corequisite(s):** CHME 498. Prerequisite(s): Senior Standing. Restricted to: CHME,CH E majors.

**CHME 491. Special Topics****3 Credits**

Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated to a maximum of 6 credits under different subtitles listed in the Schedule of Classes. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHME,CH E majors.

**Prerequisite(s):** Consent of instructor.

**CHME 495. Brewing Science & Engineering****4 Credits (3+3P)**

Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Restricted to: CHME CH E majors.

**Prerequisite(s):** CHME 441, CHME 452.

**CHME 498. Undergraduate Research****1-3 Credits (1-3P)**

Provides an opportunity for undergraduate students to work in research or areas of special interest such as design problems and economic studies under the direction of a faculty member. Written report covering work required. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHME,CH E majors.

**Prerequisite(s):** Consent of instructor and department head.

**CHME 501. Graduate Thermodynamics for Chemical Engineers****3 Credits**

Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics. Restricted to: CHME,CH E majors.

**CHME 506. Graduate Transport Phenomena(s)****3 Credits**

Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence.

**CHME 513. Intermediate Chemical Engineering Data Analysis (s)****3 Credits**

Intermediate topics in the design and analysis of typical chemical engineering experiments. Topics covered include: linear models, constrained experimental space, non-linear models, model discrimination, and response surface methodologies. Restricted to: CHME,CH E majors.

**CHME 516. Numerical Methods in Chemical Engineering****3 Credits**

Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering.

**CHME 530. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Crosslisted with: C E 330, E E 330, I E 330.

**CHME 541. Chemical Kinetics and Reactor Engineering****3 Credits**

Same as CHME 441 with differentiated assignments for graduate students. Consent of Instructor required.

**Prerequisite(s):** Consent of Instructor.

**CHME 542. Graduate Reactor Analysis and Design (s)****3 Credits**

Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems.

**CHME 549. Intellectual Property for Engineers and Scientists****3 Credits**

An overview of intellectual property, including patents, trade secrets, copyright, and trademark. Specialized terminology; protectable subject matter and applicable legal standards; inventorship, authorship and ownership; application content and preparation; procedural and substantive application components; and infringement and enforcement. Taught with CHME 449.

**Prerequisite(s):** CHEM 111G or CHEM 115.

**CHME 561. Calculation of Material and Molecular Properties****3 Credits**

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CH E 461. Consent of Instructor required.

**Prerequisite(s):** CHEM 116, MATH 192G, and (PHYS 214 or PHYS 216G).

**CHME 563. Soft Matter****3 Credits**

The physiochemistry of soft materials including gels, polymers and colloids, self-assembly, intermolecular forces, and colloidal forces. Taught with CHME 463.

**Prerequisite(s):** CHME 302, CHME 305, CHME 361.

**CHME 564. Polymer Science & Engineering****3 Credits**

Synthesis, structure, property relationships of synthetic polymers. Taught with CHME 464. May be repeated up to 3 credits.

**Prerequisite(s):** CHME 201, CHEM 314.

**CHME 565. Rheology and Viscoelasticity****3 Credits**

This course is an introduction to rheology and viscoelasticity. In particular, the flow behavior of Non-Newtonian Fluids and Viscoelastic Fluids will be covered. Rheometry, the technique for characterization of fluids, will be discussed. Most of the course is quantitative and uses mathematical modeling. Taught with CHME 465.

**Prerequisite(s):** CHME 306.

**CHME 567. Nanoscience and Nanotechnology****3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Taught with CHME 467.

**Prerequisite(s):** (CHEM 112G or CHEM 116G) and (PHYS 211G or PHYS 215G).

**CHME 568. Intermediate Adsorption****3 Credits**

Introduction to the fundamentals and applications of biofuels and bioenergy produced from biomass; renewable feedstocks, their production, availability and attributes for biofuel/bioenergy production; types of biomass-derived fuels and energy; thermochemical conversion of biomass to heat, power, and fuel; biochemical conversion of biomass to fuel; biodiesel production; environmental impacts of biofuel production; economics and life-cycle analysis of biofuel; value-added processing of biofuel residues; term paper of selected topics relevant to biofuels. Taught with CHME 468.

**Prerequisite(s):** CHME 201.

**CHME 579. Corrosion and Degradation of Materials****3 Credits**

Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstructure on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories. Taught with CHME 479.

**Prerequisite(s):** CHME 361.

**CHME 581. Biomedical Engineering & Helathcare Engineering****3 Credits**

Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. Taught with CHME 481.

**Prerequisite(s):** CHEM 116G, CHME 201.

**CHME 585. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing and applications of biomass materials to fulfill food, feed, fiber, fuel and chemical feedstock needs with energy, water, cost, sustainability, and waste management considerations. Taught with CHME 485.

**Prerequisite(s):** CHEM 211 or 313 or consent of instructor.

**CHME 586. Biofuels****3 Credits**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 201.

**CHME 588. Elements of XRD****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: PHYS 568.

**CHME 589. Modern Materials****3 Credits**

Same as PHYS 489 with differentiated assignments for graduate students. Crosslisted with: PHYS 589.

**Prerequisite(s):** PHYS 455 or PHYS 554.

**CHME 590. Graduate Seminar****1 Credit**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Restricted to: CHME majors.

**CHME 594. Professional Communication in Chemical Engineering****2 Credits**

Connections between interpersonal relationships and the effective communication of information. Strategies for formal and informal written and verbal communication in the context of presentations, interviews, reports and publications. Factors affecting non-verbal communication.

Special focus will be given to understanding and adapting to the audience's perspective. 2 credits. Open to chemical engineering graduate students or by permission of instructor. This class will prepare you to communicate technical information effectively within a variety of contexts and to a variety of audiences. Class assignments will be partially based on current student needs such as preparing presentations for professional conferences, giving research progress reports, and writing research manuscripts. Restricted to: CHME majors.

**Prerequisite(s):** CHME graduate student standing.

**CHME 598. Ph.D. Research- Level I****1-9 Credits (1-9)**

Individual investigations either analytical or experimental. May be repeated up to 6 credits.

**CHME 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**CHME 690. Graduate Seminar****1 Credit**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated for a maximum of 8 credits. May be repeated up to 8 credits. Restricted to: CHME majors.

**CHME 698. Ph.D. Research- Level II****1-9 Credits (1-9P)**

Advanced topics for current research. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits. Consent of Instructor required.

**Prerequisite(s):** successful completion of Ph D qualifying exam.

**CHME 700. Doctoral Dissertation****15 Credits (15)**

Individual research in selected topics of current interest in chemical engineering. May be repeated up to 88 credits. Thesis/Dissertation Grading.

**Prerequisite(s):** CHME 698 (9 credits) and successful completion of comprehensive exam.

**Name:** David A. Rockstraw, Ph. D., P. E. (drockstr@nmsu.edu)

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**Website:** <http://chme.nmsu.edu/>

## Chemical Engineering - Bachelor of Science in Chemical Engineering

The BS Chemical Engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

### Requirements (Total Credits 136)

In addition to satisfying the requirements of New Mexico State University and the College of Engineering, CHME majors must pass departmental courses with a grade of C- or better.

CHME majors must have completed CHME 201 Energy Balances & Basic Thermodynamics prior to taking any 400-level CHME elective courses.

Degree requirements can also be found summarized in flow diagrams found on the CHME website (<https://chme.nmsu.edu/academics/undergrad/chme-flow-diagrams/>).

#### General Education

##### State of New Mexico Common Core

###### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
ENGL 218G	Technical and Scientific Communication	3
COMM 265G	Principles of Human Communication	3

###### Area II: Mathematics

MATH 191G	Calculus and Analytic Geometry I	4
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###### Area III: Natural Science

CHEM 115	Principles of Chemistry I	4
CHEM 116	Principles of Chemistry II	4

###### Area IV: Social and Behavioral Sciences

Economics, Political Science, Psychology, Sociology, and Anthropology electives <sup>1</sup>	9
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###### Area V: Humanities and Fine Arts

History, Philosophy, Literature, Art, Music, Dance, Theater, or Foreign Language electives <sup>1</sup>	6
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#### Viewing a Wider World Elective

Viewing a Wider World electives <sup>2</sup>	3
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#### Program Specific Requirements

##### Mathematics

MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3

##### Natural Science

BIOL 211G	Cellular and Organismal Biology	3
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 433	Physical Chemistry I	3
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1
PHYS 216G	Engineering Physics II	3

PHYS 216GL	Engineering Physics II Laboratory	1
<i>Engineering</i>		
ENGR 100	Introduction to Engineering	3
I E 311	Engineering Data Analysis	3
I E 365	Quality Control	3
<b>Chemical Engineering Common Core</b>		
CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3
CHME 323 L	Transport Operations and Instrumentation Laboratory I	1
CHME 324 L	Transport Operations and Instrumentation Laboratory II	1
CHME 352 L	Simulation of Unit Operations	1
CHME 361	Engineering Materials	3
CHME 392	Numerical Methods in Engineering	3
CHME 412	Process Dynamics and Control	3
CHME 423 L	Unit Operations Laboratory I	1
CHME 424 L	Process Control Laboratory	1
CHME 441	Chemical Kinetics and Reactor Engineering	3
CHME 448	Industrial Safety	3
CHME 452	Chemical Process Design & Economic Evaluation	3
CHME 452 L	Chemical Process Simulation	1
CHME 455	Chemical Plant Design	3
CHME 455 L	Chemical Plant Simulation	1
CHME Electives <sup>3</sup>		6
Total Credits		136

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> See the Viewing a Wider World (p. 48) (p. 46) section of the catalog for a full list of courses. Also see the 9-credit hour rule at the bottom of the page. CHMEs meet the 9-credit hour rule through the sequence CHEM 313/314/433, and thus only need to complete 3 credits of VWW.

<sup>3</sup> [chme.nmsu.edu/academics/syllabi/#CHME\\_Elective\\_Courses](https://chme.nmsu.edu/academics/syllabi/#CHME_Elective_Courses) ([https://chme.nmsu.edu/academics/syllabi/#CHME\\_Elective\\_Courses](https://chme.nmsu.edu/academics/syllabi/#CHME_Elective_Courses))

## Biomedical Engineering - Undergraduate Minor

The Biomedical Engineering minor-of-study is a 20-credit hour program of study designed to accomplish two objectives:

1. Require courses in basic biology, anatomy, physiology to provide students a basic understanding of life and the design and mechanics/dynamics of the human body. Also required is the only biomedical engineering course taught on the NMSU campus.
2. Permit students to select from a wide range of elective courses (<https://chme.nmsu.edu/academics/minors/biomedical-engineering/>) (<https://chme.nmsu.edu/academics/minors/biomedical-engineering/>) numbered above 400 that emphasize engineering topics with application to the design and development of medical devices.

### Required Courses

CHME 481	Biomedical Engineering and Engineering Healthcare	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 353	Pre-Professional Human Anatomy	4
BIOL 354	Physiology of Humans	3
Electives		6
Total Credits		20

## Brewery Engineering- Undergraduate Minor

It has long been recognized that the study of chemical engineering is appropriate to the understanding of a vast range of concepts associated with the brewing industry. In 1935, this article by M. B. Donald described many of the fundamental process steps for which the BSCHE prepares a student to begin work in the industry. This 18 credit hour minor of study is designed to prepare CHME students for careers in the brewing industry or as a craft brew entrepreneur per the 4-year curriculum suggestions of the Master Brewer's Association of the Americas. Elective courses are to be selected from the lists and guidelines maintained on the Brewery Engineering minor of study webpage (<https://chme.nmsu.edu/academics/minors/brewery-engineering/>).

CHME 395V	Brewing Science and Society	3
CHME 495	Brewing Science & Engineering	4
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BCHE 395	Biochemistry I	3
Electives		3
Total Credits		18

## Computational Engineering- Undergraduate Minor

The minor in Computational Engineering is designed to provide students with a concentration in the broad spectrum of computations in engineering, including experience with experience with an object-oriented programming language, a background in computational math techniques, and a number of courses that develop or apply engineering software across a broad base of engineering design problems.

Electives must be taken from the list maintained on the Computational Engineering minor webpage (<https://chme.nmsu.edu/academics/minors/computational-engineering>)

I E 311	Engineering Data Analysis ((or CHME 311 or STAT 371))	3
CHME 392	Numerical Methods in Engineering ((or M E 261))	3
C S 151	C++ Programming ((or ICT 352 or E T 262 or equivalent pre-approved object-oriented programming course))	3
Electives		9
Total Credits		18

## Materials Engineering - Undergraduate Minor

The Materials Engineering minor at New Mexico State University is part of a materials education program that addresses the growing demand for engineers and scientists with understanding of the wide range of materials, their properties and means of characterization. A student must pass 18 credits of courses with a grade C- or better. The minor elective courses are chosen from list available on the Chemical and Materials Engineering website (<http://chme.nmsu.edu/academics/minors/materials-engineering/>). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

### Required Courses

CHME 361	Engineering Materials	3
Electives <sup>1</sup>		15
Total Credits		18

## Nuclear Chemical Engineering - Undergraduate Minor

The Nuclear Chemical Engineering minor at New Mexico State University is part of a nuclear education program that addresses the growing demand for engineers and scientists with background in the nuclear industry. A student must pass 18 credits of elective courses with a grade C- or better. The courses are upper division courses. Three elective courses must be selected from the list maintained on the CHME website (<http://chme.nmsu.edu/academics/minors/nuclear-chemeng/>). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

### Required Courses

CHME 470	Introduction to Nuclear Energy	3
CHME 471	Health Physics	3
CHME 476	Nuclear Fuel Cycles	3
Electives		9
Total Credits		18

## Pre-Law in Intellectual Property - Undergraduate Minor

The Pre-Law Intellectual Property minor at New Mexico State University is part of a pre-law education program that addresses the growing demand for lawyers with a strong understanding of a broad cross-section of STEM subjects. A student must pass 19 credits of courses with a grade C- or better chosen from Pre-Law Intellectual Property minor page available on the Chemical and Materials Engineering website. No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

### Required Courses

CHME 449	Intellectual Property for Engineers and Scientists	3
COMM 351	Persuasion Theory and Practice	3
BLAW 316	Legal Environment of Business	3
ENGL 311G	Advanced Composition	3
GOVT 308	Prepping for Law School Admissions Test	1
GOVT 100G	American National Government	3
PHIL 100G	Philosophy, Law and Ethics	3
Total Credits		19

## Pre-Medicine Studies- Undergraduate Minor

The Pre-Medical School minor at New Mexico State University is part of a pre-medicine education program that addresses the growing demand for doctors, surgeons, and biomedical researchers with a strong understanding of a broad cross-section of STEM subjects and who model the human body as a series of interacting chemical process units. This minor of study is designed for students seeking a strong pre-med background (for both MCAT prep and program entry prereq completion) or who may be targeting a graduate degree in biomedical engineering. A student must pass 22 credits of courses with a grade C- or better. The minor includes 19 credit hours of required courses, and 3 credit hours of elective courses. No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

CHME 305	Transport Operations I: Fluid Flow	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 353	Pre-Professional Human Anatomy	4
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	1
BIOL 354	Physiology of Humans	3
BIOL 354 L	Laboratory of Human Physiology	1
BCHE 395	Biochemistry I	3
Elective		3
Total Credits		22

## Chemical Engineering - Master of Science in Chemical Engineering

The program of study leading to the MS consists of 32 credits which includes:

- required CHME core graduate courses (14 credits);
- CHME elective courses numbered 455-589 (3 credits);
- other graduate elective courses (9 credits); and
- thesis as CHME 599 Master's Thesis (6 credits).

**Required Core Courses**

CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 506	Graduate Transport Phenomena(s) (Spring semester course)	3
CHME 516	Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s) (Spring semester course)	3
CHME 594	Professional Communication in Chemical Engineering	2
<b>Electives</b>		
CHME electives (select from CHME 455-CHME 589)		3
Electives <sup>1</sup>		9
<b>Master's Thesis</b>		
CHME 599	Master's Thesis (minimum 6 credit hours before the thesis defense)	6
Total Credits		32

<sup>1</sup> Elective courses are intended to supplement the research work of each graduate student. These courses must be numbered 450 or above and must be approved by the thesis advisor.

## Chemical Engineering - Doctor of Philosophy

The program of study leading to the Ph.D. is available to students who have either a BS or MS in chemical engineering. Students with a BS must complete 30 course credits and 24 dissertation credits, for a total of 54 credits, including:

- required core CHME courses (14 credits);
- graduate elective courses (12 credits);
- CHME elective courses (3 credits);
- independent research as CHME 698 Ph.D. Research- Level II prior to completion of the comprehensive exam (12 credits);
- dissertation as CHME 700 after completion of the comprehensive exam (12 credits); and
- graduate seminar as CHME 690 Graduate Seminar (1 credit).

Ph.D. students must pass:

1. a qualifying examination within 24 months of starting their Ph.D. studies;
  2. a comprehensive examination completed a minimum of nine months prior to the dissertation defense; and
  3. an oral defense of the written dissertation before the dissertation committee.
4. PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

**Required Core Courses**

CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 506	Graduate Transport Phenomena(s)	3
CHME 516	Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME electives (select from CHME 455-CHME 589)		3
Electives <sup>1</sup>		12
CHME 690	Graduate Seminar	1
CHME 698	Ph.D. Research- Level II <sup>2</sup>	12
CHME 700	Doctoral Dissertation <sup>3</sup>	12
Total Credits		54

<sup>1</sup> Elective courses are intended to supplement the research work of each graduate student. These courses must be numbered 450 or above and must be approved by the dissertation advisor.

<sup>2</sup> Minimum 12 credits AFTER completion of the qualifying exam and BEFORE completion of the comprehensive exam.

<sup>3</sup> Minimum 12 credits AFTER completion of the comprehensive exam.

## Materials Engineering - Graduate Minor

The Materials Engineering minor at New Mexico State University is part of a materials education program that addresses the growing demand for engineers and scientists with understanding of the wide range of materials, their properties and means of characterization. A student must pass 18 credits of courses with a grade C or better. The minor includes one required course (CHME 361 Engineering Materials), and the balance elective courses chosen from menus available on the Chemical and Materials Engineering website (<http://chme.nmsu.edu/academics/minors/materials-engineering/>). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

**Required Courses**

CHME 361	Engineering Materials	3
Electives		15
Total Credits		18

## Civil Engineering

### Undergraduate Program Information

The curriculum in civil engineering is designed to provide a broad background and is so arranged that students may, in their senior year, specialize in one or more of the options listed or work in one or more areas of civil engineering. Students may elect to obtain more than one option in civil engineering.

#### Mission

The mission of the Civil Engineering Department is to offer a high quality and accredited degree that prepares our graduates for professional licensure leading to successful civil engineering careers in industry and government or for success at the graduate level. Toward this end, the Civil Engineering Department will recruit and maintain a diverse, highly skilled faculty.

#### Program Educational Objectives

In support of the mission, the Civil Engineering Department adopts the following program educational objectives:

1. Prepare our graduates to achieve professional engineering licensure and productivity in a civil engineering setting.
2. Prepare our graduates to be future leaders and public sector employees in civil engineering fields.
3. Prepare our graduates to pursue and complete a graduate level degree.
4. Maintain and further develop a high quality accredited civil engineering program that is competitive with comparable programs throughout the nation.

#### Program Criteria

The Civil Engineering curriculum is developed based on the program criteria established collaboratively by the Engineering Accreditation Commission (EAC) of ABET Inc. and the American Society of Civil Engineers (ASCE). The curriculum specifically prepares civil engineering students at the baccalaureate level to graduate with the ability to:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, general chemistry, and probability and statistics to assess uncertainty.
2. Analyze and solve problems in various areas of civil engineering.
3. Conduct experiments associated with civil engineering, as well as analyze and interpret the collected data.
4. Design a system, component, or process in various civil engineering contexts considering sustainability.
5. Explain basic concepts related to project management, business, public policy, and leadership.
6. Analyze issues related to professional ethics and explain the importance of professional licensure.

In accordance with the program criteria of ABET and ASCE, the Civil Engineering faculty responsible for teaching design-oriented courses are qualified in their respective professional areas by means of licensure, or a combination of education and design experience. Furthermore, the faculty are given responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

## Graduate Program Information

### Mission Statement

Provide research-based, post-baccalaureate programs leading to Master of Science (MS) and Doctor of Philosophy (Ph.D.) degrees for students pursuing advanced practice-oriented or academic careers in the areas of structural, geotechnical, water resources, transportation, and environmental engineering.

### Vision Statement

The program goal is to enhance social well-being by modernizing civil infrastructure for improved performance, efficiency, reliability, and resilience. Through a combination of coursework plus applied and fundamental research, the program aims to produce graduates capable of developing innovative, sustainable, and cost-effective infrastructure for the next generation.

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The Civil Engineering Department offers excellent opportunities for advanced study and professional training in several fields leading to the MSCE, MS ENVE, and the Ph.D. degrees. Students work closely with the faculty on contemporary issues including, but not limited to, ground stabilization, high performance materials, intelligent transportation systems, remote sensing, renewable energy, resilient infrastructure, structural health monitoring, sustainable construction, traffic modeling and simulation, and water treatment and reuse.

The department has excellent facilities including some 15 teaching and/or research laboratories with facilities for mechanical, chemical and biological research. The outstanding feature of the program is the energetic, highly motivated faculty and the low student-faculty ratio. The department currently has several ongoing research projects of various size and scope employing graduate students. Office space is normally provided for those students pursuing an advanced degree. Teaching and research assistantships are available to qualified students.

Students enrolling for graduate work in civil engineering must have received a bachelor's degree in engineering or one of the allied fields. A candidate for the master's degree may choose either a thesis or a non-thesis option. When a student enrolls for the Ph.D., a doctoral committee is formed to assist the student in planning a program appropriate to the student's background and goals and to administer the required examinations. All Ph.D. candidates in civil engineering must have a demonstrated proficiency in English and two research tools. Mutual understanding between the Ph.D. candidate and his or her doctoral committee on the final nature of these two research tools will be on an individual basis.

### Combined BS/MS Program

This program option provides students the opportunity to complete a BSCE and MSCE or MS ENVE with 151 credit hours; the normal tracks require 157 credit hours (BS = 127 plus MS = 30). Students accepted into this program follow the normal Civil Engineering undergraduate curriculum during their freshmen, sophomore, and junior level semesters, and the first semester of their senior year. In their final undergraduate semester, students take two graduate courses (> 500) in place of two undergraduate electives (> 450). Alternatively, students may petition for the two undergraduate electives to be counted as substitutes for the two graduate courses. In either case, the courses must be approved by the department head and completed with at least a grade of B. At this point, students receive their BSCE degree and the MSCE or MS ENVE degree

can be completed with 24 credit hours in 2 to 3 semesters for full-time students. Students must apply for admission during the final semester of their junior year and obtain prior approval by the department head before starting this program option.

## Degrees for the Department

Civil Engineering - Bachelor of Science in Civil Engineering (p. 575)

Civil Engineering - Master of Science in Civil Engineering (p. 577)

Environmental Engineering - Master of Science in Environmental Engineering (p. 579)

Engineering - Doctor of Philosophy (p. 580)

## Minors for the Department

Agricultural Engineering - Undergraduate Minor (p. 577)

**Professor David V. Jauregui<sup>1</sup>, Department Head**

**Professor J. Phillip King<sup>1</sup>, Associate Department Head**

**Professors** Jauregui<sup>1</sup>, Khandan<sup>1</sup>, King<sup>1</sup>, Martin<sup>1</sup>, Newton<sup>1</sup>, Reddi<sup>1</sup> (Dean of College of Engineering), Samani<sup>1</sup>, White<sup>1</sup> (Emeritus); **Associate**

**Professors** Bandini<sup>1</sup>, Bawazir, Cortes, Papelis, Weldon, Xu; **Assistant**

**Professors** Dehghan-Niri, Ray, Zhang<sup>1</sup>

*P. Bandini, Ph.D. (Purdue) – geotechnical engineering; A. S. Bawazir, Ph.D. (New Mexico State) – agricultural/water resources engineering; D. Cortes, Ph.D. (Georgia Tech) – geotechnical engineering; E. Dehghan-Niri, Ph.D. (SUNY-Buffalo) – structural engineering; D. V. Jáuregui, Ph.D. (Texas-Austin) – structural engineering; N. N. Khandan, Ph.D. (Drexel) – environmental engineering; J. P. King, Ph.D. (Colorado State) – agricultural/water resources engineering; P. T. Martin, Ph.D. (Nottingham, UK) – transportation engineering; C. Newton, Ph.D. (Washington) – structural engineering; L. Papelis, Ph.D. (Stanford) – environmental engineering; T. Ray, Ph.D. (SUNY-Buffalo) – structural engineering; L. N. Reddi, Ph.D. (Ohio State) – geotechnical engineering; Z. Samani, Ph.D. (Utah State) – agricultural/water resources engineering; B. Weldon, Ph.D. (Notre Dame) – structural engineering; K. R. White, Ph.D. (Texas Tech) – structural engineering; P. Xu, Ph.D. (ENGREF, Paris, France) – environmental engineering; Y. Zhang, Ph.D. (Missouri-Columbia) – environmental engineering.*

<sup>1</sup> Registered Professional Engineer

## Civil Engineering Courses

**C E 109. Computer Drafting Fundamentals**

**3 Credits (2+2P)**

Same as DRFT 109, E T 109, SUR 109.

**C E 151. Introduction to Civil Engineering**

**3 Credits**

Problem solving and use of computer software for civil engineering applications. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Prerequisite(s): ENGR 100.

**C E 160. Geology for Engineers**

**4 Credits (3+3P)**

Basic concepts of geology, earth materials, and earth processes as they relate to engineering practice. Restricted to Las Cruces campus only.

**C E 198. Special Topics**

**1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 233. Mechanics-Statics**

**3 Credits**

Engineering mechanics using vector methods. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 215G. Prerequisite(s): MATH 192G and cumulative GPA of 2.0.

**C E 234. Mechanics-Dynamics**

**3 Credits**

Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits. Crosslisted with: M E 234.

**Prerequisite(s):** C E 233, MATH 192G, PHYS 215G.

**C E 256. Environmental Engineering and Science**

**3 Credits**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: E S 256

**Prerequisite(s):** CHEM 111 and MATH 191G.

**C E 256 L. Environmental Science Laboratory**

**1 Credit**

Laboratory experiments associated with the material presented in C E 256. Same as E S 256L.

**Corequisite:** C E 256.

**C E 298. Special Topics**

**1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 301. Mechanics of Materials**

**3 Credits**

Stress, strain, and elasticity of materials. May be repeated up to 3 credits.

**Prerequisite(s):** C E 233 or M E 236.

**C E 311. Civil Engineering Materials**

**3 Credits (2+3P)**

Introduction to the structure, physical properties, testing and mechanical behavior of civil engineering materials and components made from these materials.

**Prerequisite:** C E 301.

**C E 315. Structural Analysis**

**4 Credits (3+3P)**

Classical analysis of determinate and indeterminate structures; introduction to modern methods of structural analysis using computer programs.

**Prerequisite(s):** C E 301.

**C E 331. Fluid Mechanics and Hydraulics**

**3 Credits**

Fluid Mechanics and Hydraulics. Fundamentals and theory of fluid mechanics, compressible fluids, flow of incompressible fluids in open and closed conduits. Restricted to: CE majors.

**Prerequisite(s):** PHYS 215, C E 233.

**C E 331 L. Fluid Mechanics and Hydraulics Laboratory**

**1 Credit**

Fundamentals and Theory of Fluid Mechanic, compressible and incompressible flow of fluids in open and closed conduits.

**Prerequisite(s)/Corequisite(s):** C E 331. Restricted to: C E majors.

**C E 355V. Technology and the Global Environment****3 Credits**

A scientific basis for understanding changes in the global environment that result through the complex interactions of natural phenomena and the impacts of the activities of man.

**Prerequisites:** junior or senior standing, and the general education requirements for math and natural sciences.

**C E 356. Fundamentals of Environmental Engineering****3 Credits**

Introduction to water treatment and water pollution and the analysis and design of selected treatment processes.

**Prerequisite(s):** C E 256.

**C E 357. Soil Mechanics****3 Credits (2+3P)**

Engineering properties of soils, consolidation settlement, compaction, water flow through soils, geostatic stresses, soil shear strength, lateral earth pressure, and soil laboratory testing.

**Prerequisite(s):** C E 160 or GEOL 111G, and C E 301.

**C E 382. Hydraulic and Hydrologic Engineering****3 Credits**

Analysis and design of hydraulic systems, including pipe networks, open channels, regulating structures, and pumping systems. Surface water and groundwater hydrology, analysis and design. May be repeated up to 3 credits.

**Prerequisite(s):** C E 331 and C E 331 L.

**C E 398. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 430. Environmental Management Seminar II****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: CH E 430, E E 430, E S 430, E T 430, I E 430, M E 430 and WERC 430

**C E 444. Elements of Steel Design****3 Credits**

Analysis and design of tension members, beams, columns, and bolted and welded connections.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 445. Reinforced Concrete Design****3 Credits**

Design and mechanics of structural reinforced concrete members.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 452. Geohydrology****3-4 Credits (3+1P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: E S 452 and GEOL 452.

**Prerequisite(s):** Junior or Senior.

**C E 454. Wood Design****3 Credits**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 455, Masonry Design.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 455. Masonry Design****3 Credits**

Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454, Wood Design.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 457. Foundation Design****3 Credits (2+3P)**

Application of principles of classical soil mechanics to the design of shallow and deep foundations, and the fundamentals of geotechnical site investigation.

**Prerequisite(s):** C E 357.

**C E 460. Site Investigation****3 Credits (2+2P)**

Investigation and characterization of surficial and subsurface geologic materials and ground water for civil engineering projects. Includes exploration program, drilling and sampling, rock and soil classification and logging, groundwater monitoring, profiles, and preparation of geotechnical reports. Pre/

**Prerequisite(s):** C E 357.

**Corequisite(s):** C E 457.

**C E 469. Structural Systems****3 Credits**

Design of structural systems for buildings and bridges. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C E 444 and C E 457 and C E 477.

Prerequisite(s): C E 445.

**C E 470. Design of Municipal and Hazardous Waste Landfills****3 Credits**

Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills.

**Prerequisite(s):** C E 357 and C E 452, or consent of instructor.

**C E 471. Transportation Engineering****3 Credits**

Highway and traffic design and systems.

**Prerequisite(s):** MATH 291.

**C E 473. Transportation Analysis****3 Credits**

Transportation Analysis of land-based transportation modes. Crosslisted with: C E 573.

**Prerequisite(s):** C E 471.

**C E 477. Engineering Economics and Construction Management****3 Credits**

Engineering economics, construction and project management. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** STAT 371, C E 357.

**C E 479. Pavement Analysis and Design****3 Credits**

Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, and rehabilitation concepts.

**Prerequisite(s):** C E 357.

**C E 481. Civil Engineering Capstone Design****3 Credits**

Culminating multidisciplinary project-oriented capstone design. Ethics, professional development, global issues.

**Prerequisite(s)/Corequisite(s):** C E 457, C E 471, C E 477. Prerequisite(s): C E 356, C E 382, and either C E 444 or C E 445.

**C E 482. Hydraulic Structures****3 Credits**

Engineering design of water-regulating structures. Capstone design course. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C E 477. Prerequisite(s): C E 382.

**C E 483. Surface Water Hydrology****3 Credits**

Hydrologic cycle and relationships between rainfall and surface water runoff.

**Prerequisite:** C E 331 or consent of instructor.

**C E 485. Design of Earth Dams****3 Credits**

Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors.

**Prerequisite(s):** C E 357.

**C E 498. Special Topics****1-3 Credits**

May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of department head.

**C E 501. Advanced Mechanics of Materials****3 Credits**

Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on elastic foundations, column theories, torsion, thick-wall cylinders. Same as M E 501.

**Prerequisites:** C E 301, MATH 392.

**C E 502. Advanced Mechanics of Steel Structures****3 Credits**

Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion.

**Prerequisite:** C E 444.

**C E 503. Special Design and Analysis Program****3-6 Credits**

Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. May be repeated once for a total of 6 credits.

**Prerequisite:** consent of instructor/committee.

**C E 504. Advanced Engineering Design****3 Credits**

Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled.

**Prerequisite:** consent of instructor/committee.

**C E 505. Advanced Mechanics of Concrete****3 Credits**

Advanced structural mechanics applicable to concrete structures. Topics include: nonlinear-elastic modeling and analysis of reinforced concrete structures, seismic behavior of reinforced concrete structures, and deformation of members under various loads. To be taught along with C E 605.

**Prerequisite(s):** C E 445.

**C E 506. Advanced Soil Mechanics****3 Credits**

Stress and strain analyses in soil, stress paths; drained and undrained shear strengths of granular soils and clays, consolidation, liquefaction, soil improvement.

**Prerequisite:** C E 457 or consent of instructor.

**C E 507. Design of Earth Retaining Structures****3 Credits**

Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing. Pre/

**Prerequisite(s):** C E 357.

**Corequisite(s):** C E 457.

**C E 508. Advanced Soil Behavior****3 Credits**

The course covers particle-scale phenomena that govern the macro-scale behavior of soils. Topics covered in the class include classical concepts as well as contemporary advances in soil mechanics. The students will develop a fundamental understanding of soil-water interaction, theories of contact level deformation, and mass and energy transport through granular media. Consent of Instructor required.

**Prerequisite(s):** C E 357 or Instructor Consent.

**C E 509. Deep Foundations****3 Credits**

Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads.

**Prerequisite:** C E 457 or consent of instructor.

**C E 515. Finite Element Methods****3 Credits**

Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software.

**Prerequisite:** graduate standing or consent of instructor.

**C E 530. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research.

**C E 531. Open Channel Hydraulics****3 Credits**

Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation.

**Prerequisite:** C E 382 or consent of instructor.

**C E 543. Advances in Concrete Technology****3 Credits**

Advanced topics related to concrete materials, including mixture proportioning with nontraditional admixtures, roles and side effects of concrete admixtures, durability of concrete, nondestructive testing of concrete, creep, and shrinkage.

**Prerequisites:** C E 311 and C E 445.

**C E 544. Advanced Design of Steel Structures****3 Credits**

Connection design; beam, column, and beam-column stability and design; and seismic frame design.

**Prerequisites:** C E 444 and C E 468.

**C E 545. Advanced Concrete Design****3 Credits**

Prestressed concrete, ultimate strength theory, design of shell structures.

**Prerequisites:** C E 445 and C E 468.

**C E 547. Bridge Engineering****3 Credits**

Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation. May be repeated for a maximum of 6 credits.

**Prerequisite:** C E 469 or consent of instructor.

**C E 554. Wood Design****3 Credits**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design.

**C E 555. Masonry Design****3 Credits**

Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554 - Wood Design.

**C E 557. Water Resources Development****3 Credits**

Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details. Background: C E 450.

**Corequisite:** C E 483, or C E 482.

**C E 571. Structural Dynamics****3 Credits**

Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading.

**Prerequisite:** C E 468 or consent of instructor.

**C E 572. Earthquake Engineering****3 Credits**

Earthquake characteristics; seismic loads; elastic and inelastic response; analysis and design of buildings for earthquakes.

**Prerequisites:** graduate standing and consent of instructor.

**C E 573. Transportation Analysis****3 Credits**

Transportation analysis of land-based transportation modes. Crosslisted with: C E 473.

**Prerequisite(s):** C E 471.

**C E 577. Advanced Pavement Analysis****3 Credits**

Review of advanced constitutive models for pavement materials and their implementation in finite element analysis.

**Prerequisite(s):** C E 479 and C E 515 or consent of instructor.

**C E 579. Ground Improvement****3 Credits**

The objective of this course is to introduce common ground improvement techniques, including mechanical (compaction, soil reinforcement, preloading and accelerated consolidation) and chemical (cementing, ion-replacement, polymer bonding) stabilization methods, as well as seepage and dewatering. Emphasis will be placed on developing an understanding of the underlying physical and chemical processes involved in each case.

**Prerequisite(s):** C E 357.

**C E 581. Ground Water Hydrology****3 Credits**

Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality.

**Prerequisites:** MATH 392, G EN 452, and C E 382, or consent of instructor.

**C E 582. Statistical Hydrology****3 Credits**

Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. May be repeated up to 3 credits.

**C E 585. Slope Stability Analysis and Design****3 Credits**

Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.

**C E 586. Geotechnical Earthquake Engineering****3 Credits**

Earthquake origin and geology; wave propagation; dynamic soil properties; ground response analysis; local site effects; design ground motion; liquefaction assessment. Consent of Instructor required.

**Prerequisite(s):** C E 506 or consent of instructor.

**C E 596. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester.

**C E 599. Master's Thesis****15 Credits**

Thesis.

**C E 600. Doctoral Research****1-15 Credits**

Research.

**C E 604. Advanced Engineering Topics****3 Credits**

In depth study of a topic at the forefront of environmental engineering & science. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally.

**C E 615. Advanced Finite Element Methods****3 Credits**

Finite element method with emphasis on stress analysis. May include development and use of plane stress, plane strain, and 3-D and shell elements. Includes static, dynamic, and nonlinear analysis.

**Prerequisite:** graduate standing.

**C E 645. Prestressed Concrete****3 Credits**

Behavior of prestressed concrete; design of statically determinate and indeterminate structures; estimation of prestress loss; flexure and shear strength; deflections and stress control; composite behavior and design.

**Prerequisites:** graduate standing and consent of instructor.

**C E 671. Scientific Approaches to Transportation Research****3 Credits**

This course addresses professional and ethical practices for doing, managing, and evaluating research programs and projects. Students will learn about the critical elements in the research process, turning research objectives into research hypotheses, testing of the hypotheses and evaluation of the results. The course will look at the scientific method as well as the management and handling of data as it applies to transportation research. Consent of Instructor required.

**Prerequisite(s):** C E 471.

**C E 682. Topics in Hydrodynamics II****3 Credits**

Selected topics in flow-in open channels, flow-through porous media, and transport of sediments and contaminants. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**C E 698. Special Research Programs****1-3 Credits**

May be subtitled. May be repeated for a maximum of 9 credits.

**C E 700. Doctoral Dissertation****15 Credits**

Dissertation.

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## Civil Engineering - Bachelor of Science in Civil Engineering

### Requirements (127 Credits)

In addition to the university requirements for graduation, all students including transfers must satisfy the requirements contained in the academic policies for the NMSU College of Engineering. Students must have a 2.0 grade-point average in all departmental courses and all prerequisites and co-requisites must be taken as required. If a student takes a class and a co-requisite for that class at the same time and does not achieve a grade of C- or better in the co-requisite, the student may take no further classes for which the course or the co-requisite are prerequisite. A student who completes a class three times without achieving a grade of C- or better will be dismissed from the

Civil Engineering program, and not allowed to take any Civil Engineering courses from the department.

**General Education****State of New Mexico Common Core***Area I: Communications*<sup>1</sup>

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective (ENGL 218 strongly recommended)		3
Oral Communications Elective (COMM 265 strongly recommended)		3

*Area II: Mathematics*

MATH 191G	Calculus and Analytic Geometry I	4
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*Area III: Natural Science*

CHEM 111G	General Chemistry I	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1

*Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts*<sup>2</sup>

Select 15 total credits from Area IV and V, with at least 6 credits from each area:	15
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## Area IV: Social and Behavioral Sciences:

Select 6-9 credits from Economics, Political Science, Psychology, Sociology and Anthropology electives

## Area V: Humanities and Fine Arts:

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, or Theater electives

**Institution Specific General Education**

<i>Viewing a Wider World electives</i> <sup>2</sup>	6
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**Program Specific Requirements***Mathematics*

MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3
STAT 371	Statistics for Engineers and Scientists I	3

*Natural Science*

GEOL 111G	Introductory Geology	4
PHYS 216G	Engineering Physics II	3
PHYS 216GL	Engineering Physics II Laboratory	1

*Technical*

ENGR 100	Introduction to Engineering	3
SUR 222	Plane Surveying	3

*Civil Engineering*

C E 151	Introduction to Civil Engineering	3
C E 233	Mechanics-Statics	3
C E 234	Mechanics-Dynamics	3
or M E 234	Mechanics-Dynamics	
C E 256	Environmental Engineering and Science	3
C E 256 L	Environmental Science Laboratory	1
C E 301	Mechanics of Materials	3
C E 311	Civil Engineering Materials	3
C E 315	Structural Analysis	4
C E 331	Fluid Mechanics and Hydraulics	3

C E 331 L	Fluid Mechanics and Hydraulics Laboratory	1
C E 356	Fundamentals of Environmental Engineering	3
C E 357	Soil Mechanics	3
C E 382	Hydraulic and Hydrologic Engineering	3
C E 445	Reinforced Concrete Design	3
C E 457	Foundation Design	3
C E 471	Transportation Engineering	3
C E 477	Engineering Economics and Construction Management	3
Civil Engineering Option Electives		6
<i>Capstone Course</i> <sup>3</sup>		
Select one from the following:		3
C E 469	Structural Systems	
C E 482	Hydraulic Structures	
C E 485	Design of Earth Dams	
ENVE 456	Environmental Engineering Design	
<b>Concentrations</b>		
Select from the following concentrations:		
Environmental		
General		
Geotechnical		
Structural		
Water Resources		
Total Credits		127

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> Students must complete 15 total credits from Area IV and V, with at least six credits from each area, including ECON 251G Principles of Macroeconomics or ECON 252G Principles of Microeconomics as an Area IV course. In addition, students must complete 6 total credits of Viewing a Wider World (VWW) electives. See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>3</sup> Students are required to take three credits of capstone design. The required capstone design course depends on the area of concentration as follows: C E 469 Structural Systems (structural); C E 482 Hydraulic Structures (water resources); C E 485 Design of Earth Dams (geotechnical); and ENVE 456 Environmental Engineering Design (environmental). For the general option, students may take any one of the four capstone design courses.

### Concentration: Environmental (9 credits)

#### Required Elective Courses

Select two from the following:		6
ENVE 450	Aquatic Chemistry	
ENVE 451	Unit Processes/Operation of Water Treatment	
ENVE 452	Unit Processes/ Operation of Wastewater Treatment	
ENVE 458	Urban Water-Energy-Environment Systems	
ENVE 487	Air Pollution Control Systems Design	

#### Required Capstone Design

ENVE 456	Environmental Engineering Design	3
Total Credits		9

### Concentration: General (9 credits)

#### Required Elective Courses

Design electives selected from Environmental, Structural, Water Resources, or Geotechnical Options (other Civil Engineering electives may be taken under General Option with approval of department head)	6
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#### Required Capstone Design

Capstone design selected from Environmental, Structural, Water Resources, or Geotechnical Options	3	
Total Credits		9

### Concentration: Geotechnical (9 credits)

#### Required Elective Courses

Select two from the following:		6
C E 452	Geohydrology	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design	

#### Required Capstone Design

C E 485	Design of Earth Dams	3
Total Credits		9

### Concentration: Structural (9 credits)

#### Required Elective Courses

C E 444	Elements of Steel Design	3
Select one from the following:		3
C E 454	Wood Design	
C E 455	Masonry Design	
C E 544	Advanced Design of Steel Structures (requires department head approval)	
C E 545	Advanced Concrete Design (requires department head approval)	

#### Required Capstone Design

C E 469	Structural Systems	3
Total Credits		9

### Concentration: Water Resources (9 credits)

#### Required Elective Courses

Select one from the following:		3
C E 483	Surface Water Hydrology	
A EN 478	Irrigation and Drainage Engineering	
Select one from the following:		3
C E 452	Geohydrology	
A EN 459	Design of Water Wells/Pumping Systems	

#### Required Capstone Design

C E 482	Hydraulic Structures	3
Total Credits		9

## Recommended Freshman Year

#### Course Sequence

ENGR 100	Introduction to Engineering	3
C E 151	Introduction to Civil Engineering	3
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
CHEM 111G	General Chemistry I	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1
ENGL 111G	Rhetoric and Composition	4
ENGL 218G	Technical and Scientific Communication	3
General Education Common Core		3
Total Credits		32

## Agricultural Engineering - Undergraduate Minor

### Soil Science

Select one from the following: 3

SOIL 472	Soil Morphology and Classification
SOIL 476	Soil Microbiology
SOIL 477	Environmental Soil Physics
SOIL 479	Environmental Soil Chemistry

### Plant and Animal Science

ANSC 351V	Agricultural Animals of the World	3
or HORT 365	Principles of Crop Production	

### Institutions/Economics

Select one from the following: 3

AG E 210G	Survey of Food and Agricultural Issues
AG E 315V	World Agriculture and Food Problems
AG E 337V	Natural Resource Economics
AG E 384V	Water Resource Economics

### Irrigation

A EN 478	Irrigation and Drainage Engineering	3
or A EN 498	Special Topics	

### Design

A EN 459	Design of Water Wells/Pumping Systems	3
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Total Credits 15

## Civil Engineering - Master of Science in Civil Engineering

In support of the mission and vision statements for the graduate program, the Civil Engineering Department adopts the following goals for the Master of Science (MS) degree:

1. Prepare students to fulfill the academic prerequisites specified by the Americans Society of Civil Engineers (ASCE) for Licensure and Professional Practice in Civil Engineering.
2. Prepare students to attain the Body of Knowledge specified by ASCE necessary for entry into the practice of civil engineering at the professional level.
3. Prepare students in conducting applied research in areas relevant to the practice of civil engineering.

4. Prepare students for advanced graduate studies towards a terminal degree.

Students may choose from the geotechnical, structural, or water resources engineering options, requirements of which are specified below. Exceptions to these requirements must be approved by the head of the department. Further information related to the MS degree may be found under the Academic Programs of Study (p. 53) section of the catalog.

## Option: Geotechnical Engineering

### Thesis Option

#### Background Courses

C E 357	Soil Mechanics
C E 457	Foundation Design
GEOL 111G	Introductory Geology (or higher-level courses)
C E 445	Reinforced Concrete Design (or higher-level courses based on ACI)

#### Core Courses

C E 506	Advanced Soil Mechanics	9
C E 509	Deep Foundations	
C E 585	Slope Stability Analysis and Design	

#### Optional Courses

Select two from the following: <sup>1</sup> 6

C E 485	Design of Earth Dams
C E 577	Advanced Pavement Analysis
C E 581	Ground Water Hydrology

Select two from the following: 6

C E 479	Pavement Analysis and Design
C E 515	Finite Element Methods (or similar course)

C E 577	Advanced Pavement Analysis
C E 586	Geotechnical Earthquake Engineering

Select 3 credits from courses outside the area or department <sup>2</sup> 3

A ST 505	Statistical Inference I (or similar statistics course)
C E 543	Advances in Concrete Technology
C E 545	Advanced Concrete Design
C E 596	Special Topics
C E 503	Special Design and Analysis Program

Select 3 credits from mathematics, numerical methods, or programming (450 or higher)

#### Research Credits

C E 599	Master's Thesis <sup>3</sup>	6
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Total Credits 30

<sup>1</sup> Can be taken as C E 503 Special Design and Analysis Program. A maximum of 6 credits of C E 503 Special Design and Analysis Program are counted toward the Masters Degree program.

<sup>2</sup> Geological Sciences or Geophysics course (For example: GEOL 470 Structural Geology).

<sup>3</sup> A maximum of 6 credits are counted toward the Masters Degree program.

**Notes:**

1. The optional courses outside the area or department should be previously approved by the academic advisor or student's Graduate Committee.
2. International students must be registered at least 9 credits per semester.
3. International students may be required to take English language courses to show proficiency in English.

Total credits needed are 24 credits of coursework and 6 credits of Master's Thesis research.

## Option: Structural Engineering Thesis Option

**Background Courses**

C E 315	Structural Analysis
C E 444	Elements of Steel Design (based on AISC)
C E 445	Reinforced Concrete Design (based on ACI)

**Core Courses** 15

C E 501	Advanced Mechanics of Materials
C E 515	Finite Element Methods
C E 544	Advanced Design of Steel Structures
C E 545	Advanced Concrete Design
C E 571	Structural Dynamics

**Optional Courses**

Select three from the following: 9

C E 502	Advanced Mechanics of Steel Structures
C E 504	Advanced Engineering Design
C E 509	Deep Foundations
C E 543	Advances in Concrete Technology
C E 547	Bridge Engineering
C E 554	Wood Design
C E 555	Masonry Design
C E 572	Earthquake Engineering
C E 577	Advanced Pavement Analysis
C E 615	Advanced Finite Element Methods
C E 645	Prestressed Concrete

**Research Credits**

C E 599	Master's Thesis <sup>1</sup>	6
<b>Total Credits</b>		<b>30</b>

<sup>1</sup> A maximum of 6 credits are counted toward the Master's Degree program.

Total credits needed are 24 credits of coursework and 6 credits of Master's Thesis research.

## Option: Water Resources Engineering Thesis Option

**Prerequisite Courses**

Core courses	12
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Statistics	3	
Area of Interest Courses	9	
C E 599	Master's Thesis	6
<b>Total Credits</b>		<b>30</b>

## Non-Thesis Option

**Requirements**

Core courses	12	
Statistics	3	
Area of Interest Courses	15	
<b>Total Credits</b>		<b>30</b>

## Foundation Requirements

1. ABET- Accredited BS in Civil, Agricultural, Geological Engineering, or closely related field or equivalent (as per existing CAGE Department regulations)
2. One course in surface water hydrology
3. One course in hydrogeology or geohydrology
4. At least three semesters of hydraulic and hydraulic design

## Core Courses

**Core Courses** 12

C E 531	Open Channel Hydraulics
C E 557	Water Resources Development
C E 581	Ground Water Hydrology
C E 582	Statistical Hydrology

**Statistics** 3

A ST 505	Statistical Inference I (or advanced statistics class if student is qualified)
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**Total Credits** 15

## Area of Interest Courses (Flexible)

**Agricultural/ Civil/ Environmental Engineering**

A EN 459	Design of Water Wells/Pumping Systems
A EN 478	Irrigation and Drainage Engineering
C E 482	Hydraulic Structures
C E 483	Surface Water Hydrology
C E 485	Design of Earth Dams
C E 503	Special Design and Analysis Program
C E 504	Advanced Engineering Design
C E 682	Topics in Hydrodynamics II
ENVE 557	Surface Water Quality Modeling
ENVE 630	Fate and Transport of Environmental Contaminants
GEOG 581	System Design for Geographic Information Science and Technology (GIS &T)
SOIL 652	Advanced Soil Physics

**Modeling/ Fluid Mechanics**

M E 530	Intermediate Fluid Mechanics
M E 533	Computational and Theoretical Fluid Mechanics
M E 580	Engineering Analysis II

**Management/Optimization**

I E 533	Linear Programming
I E 534	Nonlinear Programming
I E 535	Discrete Optimization

**Institutional Aspects**

BLAW 527	Negotiation and Business Dispute Resolution
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Approved Electives in College of Engineering: A ST, AEEC, GEOG, GEOL, MATH, STAT, and SOIL (must be approved by the Advisor and Committee Members).

# Environmental Engineering - Master of Science in Environmental Engineering

Environmental engineering at New Mexico State University provides unique educational and research opportunities at the graduate level in the fields of water quality, water treatment, water pollution control, wastewater treatment reclamation and reuse, industrial, hazardous and solid waste management, groundwater treatment, air pollution control; waste minimization and pollution prevention. Therefore, course offerings have been developed to emphasize basic engineering and scientific principles, as well as design and application of environmental engineering unit operations and processes. Special problem and thesis research are closely matched with faculty expertise and the programs and professional goals of the graduate students. Study and research programs are specifically designed for individual students, taking advantage of not only the program capabilities, but complementing activities of the university as a whole, the student's professional experience and work environment.

Graduate students satisfy degree requirements in environmental engineering by completing specific core course work. Course work in the graduate program includes:

- water and wastewater treatment,
- solid and hazardous waste systems design,
- environmental chemistry,
- environmental microbiology,
- environmental contaminant analysis,
- industrial pollution control,
- fate and transport of pollutants in engineered and natural systems and water quality in surface water and groundwater systems.

Additional topics of interest to the students are covered through special topics classes and by courses taught outside of the College of Engineering.

The MS program requires either a thesis or a non-thesis practice oriented experience. The non-thesis option is designed for students that are working full time in engineering practice, but is also available to other students interested in pursuing a non-thesis option. The thesis option consists of a minimum of 30 semester credit hours, including 6 credit hours of thesis. Students who are working full time in engineering practice may apply for the non-thesis option. This option consists of 30 semester credit hours of which up to 3 credit hours can be awarded for a professional engineering design experience and up to 6 credit hours can be awarded for an engineering practicum (ENVE 598 Special Research

Programs). Transfer credit for courses taken elsewhere is evaluated on an individual basis. Up to six semester hours of graduate level courses taken may be used to satisfy MS degree requirements provided that the credits were not used toward another degree.

## Required Curriculum

The graduate environmental engineering program of the Civil Engineering Department expects all MS and Ph.D. students to meet certain requirements in pursuit of an advanced degree. Some of these requirements are related to the quantity, level and quality of coursework. This Graduate Catalog details what is expected as a minimum for graduation, but it is up to the student and his/her advisor and graduate committee to determine the plan of study for the student. The student and his/her advisor will create this program of study in the first semester of graduate work.

Students desiring to work toward an advanced degree in environmental engineering must have completed undergraduate preparation similar to that required for a Bachelor of Science degree in an ABET accredited engineering program or must have adequate background, as determined by the graduate faculty of the program. The program administrator will approve exceptions to these requirements.

The environmental engineering faculty will form a committee for every entering student. The faculty will evaluate the student's record and determine which deficiencies and/or core courses, if any, are needed by the student. For all professional non-thesis programs, the department head will review the committee's decision. In order to provide consistency among plans of study for graduate students and to set a minimum set of core or pertinent courses, it is the policy of the graduate environmental engineering program that each graduate student will fulfill the following course requirements (or equivalent).

## Required Background Courses

The following courses may be required if the student did not take a similar course at the undergraduate level, as negotiated with the general faculty committee.

**Background Courses**

C E 356	Fundamentals of Environmental Engineering
C E 382	Hydraulic and Hydrologic Engineering
ENVE 456	Environmental Engineering Design

**Core Courses**

ENVE 550	Aquatic Chemistry	12
ENVE 551	Unit Processes/Operation of Water Treatment	
ENVE 552	Unit Processes/Operation of Wastewater Treatment	
ENVE 557	Surface Water Quality Modeling	

**Thesis or Professional Experience for MS students** 6

ENVE 598	Special Research Programs <sup>1</sup>
or ENVE 599	Master's Thesis

**Dissertation, Research Tools for Ph.D. Students** 0

Select a minimum from two research tools (3 credits each)

<b>Total Credits</b>	<b>18</b>
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<sup>1</sup> ENVE 598 Special Research Programs: practicum for students pursuing the non-thesis option. ENVE 599 Master's Thesis: required for students pursuing the thesis option.

## Professional Development Electives for the Non-Thesis Option (Outside the College of Engineering)

MS program: A minimum of six credits hours in graduate-level communications, management, economics and/or other relevant disciplines. These courses will be selected by the student and must be approved by the environmental engineering faculty (6 credits).

### Elective Courses

Select one from the following:		3
A EN 459	Design of Water Wells/Pumping Systems	
C E 557	Water Resources Development	
E S 462	Sampling and Analysis of Environmental Contaminants	
ENVE 630	Fate and Transport of Environmental Contaminants	
Total Credits		3

## Engineering - Doctor of Philosophy Concentration: Civil Engineering

In support of the mission and vision statements for the graduate program, the Civil Engineering Department adopts the following goals for the Doctor of Philosophy (Ph.D.) degree:

1. Prepare students to develop and conduct fundamental and applied research to generate innovative and original solutions for civil engineering problems.
2. Prepare students for research-based professional careers or academic careers in the civil engineering discipline.
3. Develop culture of research/teaching scholarship among students.

Students may specialize in environmental, geotechnical, structural, transportation, or water resources engineering. Further information related to the Ph.D. degree may be found under the Academic Programs of Study (p. 53) section of the catalog.

### Additional Requirements

PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

## Electrical and Computer Engineering Undergraduate Program Information

### Overview

The undergraduate electrical engineering program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc., and stresses the development of analytical tools and physical concepts required to prepare students for immediate employment or graduate study. The program is flexible, allowing students to choose elective coursework towards concentrations in:

- communications and signal processing,
- computers and microelectronics,
- control and power,
- electromagnetics and photonics, or
- space systems.

### Undergraduate Electrical Engineering Program Educational Objectives

The Klipsch School is dedicated to providing a quality, hands-on, educational experience for our students. Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduates during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

## Graduate Program Information

### Overview

The Klipsch School of Electrical and Computer Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Areas of emphasis for masters and doctoral students are:

- communications,
- computer engineering,
- control systems,
- digital signal processing,
- electromagnetics,
- electric energy systems,
- photonics, and
- microelectronics/VLSI.

Research in the above areas currently being conducted by the faculty ensures that doctoral candidates will work on the frontier of knowledge in these areas. The graduate programs are intended to provide broad graduate-level training in electrical engineering. In addition, appropriate courses in computer science, industrial engineering, mathematics, physics and business management may be integrated into a graduate student's program of study.

Students desiring to work toward an advanced degree in electrical engineering must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science in Electrical Engineering degree at this institution. For students with undergraduate degrees in other disciplines, see below. For

further information on the Klipsch School of Electrical and Computer Engineering, please consult the web page <http://www.ece.nmsu.edu/>.

### Research Facilities and Highlights

The Center for Telemetry and Telemetering hosts the Manuel Lujan, Jr. Space Tele-Engineering Program and the Frank Carden Chair for Telemetry and Telemetering. Faculty and staff in the Center are involved in education and research programs focusing on

- telecommunications,
- communication theory,
- coding and information theory,
- wireless networks,
- digital signal processing,
- optical and radio frequency communications, and
- digital image processing.

The Center has several major research sponsors including NASA, the Department of Defense, and the National Science Foundation. The director of the Center and the Frank Carden Chair is Professor Dr. Charles Creusere.

The Advanced Speech and Audio Processing Laboratory is used for both teaching and research in digital signal processing (DSP). Current research areas include

- speaker recognition,
- signal enhancement,
- low-bit rate coding,
- embedded DSP, and
- GPU-based pattern recognition for speech processing.

Research sponsors for the laboratory include Air Force Research Laboratories, Army Research Laboratory, National Geospatial Intelligence Agency, Freescale Semiconductor, IBM, Motorola, National Science Foundation, and Texas Instruments. The director of the laboratory is Dr. Phillip L. De Leon.

The New Mexico State University R.L. Golden Particle Astrophysics Lab (PAL) is dedicated to measuring and interpreting cosmic ray spectra in an effort to better understand the structure of our universe. Recent measurements of the galactic positron and electron spectra have connections to the dark matter mystery and to the identification of sources of cosmic rays. Additional studies of solar particles (measured along with cosmic rays) will help in the understanding of how solar eruptions affect the earth. The director of PAL is Dr. Steven Stochaj.

The Electromagnetics (EM) and Microwave Laboratory is used for both teaching and research in electromagnetic fields. Current research areas include

- propagation through dispersive media (soil, seawater, foliage, biological tissues),
- UWB radar and remote sensing system analysis and design,
- antenna analysis, synthesis, and design,
- bio-electromagnetics,
- brain mapping,
- computational physics,
- electromagnetic interference and compatibility,
- high performance computing, and

- nondestructive evaluation.

Research sponsors for the laboratory include American Heart Association, Department of Defense, Los Alamos National Laboratory, NASA, NSF, National Institutes of Health, Sandia National Laboratories, and White Sands Missile Range. The Director of the Electromagnetics and Microwave Laboratory is Dr. Kwong T. Ng.

New Mexico State University's program in Electric Utility Management (EUMP) is sponsored by a group of public and private electric utility companies and industrial organizations and hosts the PNM Chair for Utility Management and The Kersting Professorship. The Master of Science in Electrical Engineering degree program includes course work in public utilities regulation and is designed to prepare the student for a future engineering management position in the electric utility industry. An industry advisory committee provides the vital connecting link between the electric utility industry and the university, so that a coordinated effort may be achieved in realizing the following program objectives:

1. to provide a program of study at the graduate level in the planning, operation, and management of electric power generation, transmission, distribution, and utilization; and the integration of renewable energy and storage;
2. to supply the electric utility industry with the highest caliber of new engineering and management talent; and
3. to provide the university with the required financial and technical support to ensure a quality program.

In addition, faculty in EUMP work with M.S. and Ph.D. students to conduct funded research sponsored by Sandia National Laboratories, EPRI, NSF, DOE, CEC and the electrical utility industry. Much of the current research is focused on renewable energy integration, protection, advanced control and optimization, and customer driven microgrids. Laboratory facilities are available in the El Paso Electric Power Systems laboratory. The program works closely with the Institute for Energy and Environment (IEE) and with Southwest Technology Development Institute (SWTDI) which host the solar energy experiment station. The director of the EUMP and PNM Chair for Utility Management is Dr. Satish Ranade.

Faculty and students in the VLSI Laboratory are involved in the design and analysis of analog and mixed-signal microelectronic circuits and systems. Current research areas include

- wireless bio-circuits and sensors;
- green computing;
- intelligent sensing, sigma-delta sensing;
- low-voltage, low-power circuits;
- high performance operational amplifiers and operational transconductance amplifiers;
- energy harvesting and power management circuits; and
- analog machine vision and image processing.

Research sponsors include the National Science Foundation, Los Alamos National Laboratories and Agilent technologies. The director of the VLSI Laboratory is IEEE Fellow Dr. Jaime Ramirez-Angulo.

The Photonics program at NMSU offers unique opportunities to undergraduate and graduate students interested in pursuing a career in electro-optics, applied optics, photonics, or optical engineering by combining the optics resources of the Klipsch School and the Physics Department. Most of the optics classes are cross-listed in the two

departments. The Klipsch School's Electro-Optics Research Laboratory (EORL) provides a variety of research opportunities in areas such as

- multispectral and polarimetric imaging,
- free-space optical communications,
- adaptive optics,
- nanophotonics and
- integrated electro-optic sensors and systems.

Sponsors include the Air Force Office of Scientific Research, Sandia National Laboratories, Air Force Research Laboratory, Army Research Laboratory, NASA, National Geospatial-Intelligence Agency and the National Science Foundation. SPIE Fellow Dr. David G. Voelz is the director of the EORL and NMSU's Photonics program.

The Computer Networking Lab (CNL) supports teaching and research in Internet and wireless sensor networks. The mission of CNL is to provide students with the opportunity to do cutting-edge research that has high practical relevance. Currently, research projects in CNL include secure data dissemination in wireless sensor networks, solar-powered sensor networks, and RFID sensor networks. The major research sponsors of CNL include US Army, DHS, Intel, Los Alamos National Lab, and Sandia National Lab. CNL is directed by Dr. Hong Huang.

Students and faculty associated with the Performance Evaluation and Architecture Research Laboratory (PEARL) conduct research in the areas of

- performance modeling and simulation techniques,
- micro-architecture power optimization,
- performance analysis and optimization of large-scale scientific applications, and
- heterogeneous HPC computing for field-deployable systems.

PEARL sponsors include the Army Research Labs (ARL), High Performance Computing Research Center (AHPARC), Sandia National Laboratories, and Los Alamos National Laboratories. The laboratory's director is Dr. Hameed Badawy.

The Rio Grande Institute for Soft Computing (RioSoft) is committed to serving private-sector and U.S. government needs in researching and developing intelligent decision-support systems and tools that aid in many aspects of strategic decision-making. Soft computing which includes fuzzy logic, neural networks and evolutionary computation are used for modeling, analysis and control of complex dynamical processes in various software-hardware integrated architectures. In addition RioRoboLab, a NASA Ames funded laboratory, provides facilities for research and development of intelligent autonomous and semi-autonomous systems focusing on advanced concepts of energy harvesting and energy scavenging from ambient energy sources. Research sponsors include the Defense Threat Reduction Agency, Defense Advanced Research Projects Agency, Los Alamos National Laboratory and NASA. The director of RioSoft and RioRob Lab is Dr. Nadipuram (Ram) Prasad.

### Support for Graduate Students

A number of teaching assistantships, research assistantships and fellowships are available. Teaching assistants are recommended by individual faculty for selection by the ECE Department's Graduate Studies Committee. International students must pass university screening prior to being eligible for selection as a TA. Nominations for new TAs are made by the advisor after a student is admitted. Research assistants are hired

directly by the faculty member who has received a contract or grant for research.

The College of Engineering awards graduate scholarships and fellowships on behalf of Electrical and Computer Engineering. These include:

- the MIT/Lincoln Laboratory Fellowship,
- the Paul and Valerie Klipsch Grad Scholarship,
- the Admiral Paul Arthur Grad Scholarship, and
- the Barry Neil Rappaport Grad Scholarship.

Applications can be completed on-line at <https://scholarships.nmsu.edu/>. The priority deadline for the Scholar Dollar\$ is March 1<sup>st</sup>. The Electrical Utility Management Program has a limited number of fellowships for students interested in pursuing master's degrees in electrical energy systems.

### Admission

Prospective graduate students for the Master of Science or Doctor of Philosophy in Electrical Engineering must first meet the entrance requirements of the Graduate School. The prospective US graduate student should make formal application to the Graduate Student Services office (<http://gradschool.nmsu.edu>). International graduate students must start with the Admissions Office (<http://international.nmsu.edu/admissions.html>). Official transcripts from all undergraduate and graduate institutions must be sent directly to the Graduate School. In addition, the student must arrange to have an official copy of the GRE (Graduate Record Examination) General Test scores sent to the Graduate School. International students must also submit their TOEFL (Test of English as a Foreign Language) scores. If the applicant meets the Graduate School's minimum requirements, the application is sent to the Klipsch School's Graduate Studies Committee for review. U.S. residents are given every chance of being successful in the pursuit of a graduate degree. If they do not meet the requirements of the Klipsch School, they can enter the Graduate School as "undeclared" where they must demonstrate competence in two or more graduate-level E E courses before they re-apply.

### Requirements for Students Without BSEE Degree or Equivalent

Students without a BSEE degree or equivalent preparation will be expected to take classes covering the core knowledge required in our BSEE program. This includes mathematics through differential equations and basic engineering physics. The student's graduate advisor will prepare an individualized deficiency schedule, based on the student's academic background and work experience.

### The following courses from our undergraduate program will be considered deficiencies for students without a BSEE

E E 100	Introduction to Electrical and Computer Engineering	4
E E 112	Embedded Systems	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 212	Introduction to Computer Organization	4
E E 230	AC Circuit Analysis and Introduction to Power Systems	4
E E 240	Multivariate and Vector Calculus Applications	3
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3

E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4

## Degrees for the Department

Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 590)

Electrical Engineering - Master of Science in Electrical Engineering (p. 593)

Engineering - Doctor of Philosophy (p. 594)

## Minors for the Department

Computer Engineering - Undergraduate Minor (p. 593)

Electrical Engineering - Undergraduate Minor (p. 593)

**Department Head, Professor Satish Ranade**

**Associate Department Head, Associate Professor Paul Furth**

**Associate Department Head, Professor Steve Stochaj**

**Professors** Borah, Creusere, DeLeon, Ng, Ramirez-Angulo, Ranade, Stochaj, Voelz;

**Associate Professors** Boucheron, Brahma, Cho, Dawood, Furth, Huang, Prasad;

**Assistant Professors** Badawy, Mitchell, Sandoval, Tang;

**College Assistant Professors** Boehmer;

**Emeritus Professors** Carden, Giles, Sheila Horan, Stephen Horan, Johnson<sup>1</sup>, Jordan, Kersting, Ludeman, Merrill, Reinfelds, Smolleck<sup>1</sup>, Steelman<sup>1</sup>, Taylor

<sup>1</sup> Registered Professional Engineer (NM)

## Electrical Engineering Courses

**E E 100. Introduction to Electrical and Computer Engineering**  
**4 Credits (3+3P)**

Introduction to analog (DC) and digital electronics. Includes electric component descriptions and equations, Ohm's law, Kirchhoff's voltage and current laws, ideal op-amp circuits, Boolean algebra, design of combinational and sequential logic circuits and VHDL or VERILOG. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** C- or better in MATH 190G.

**E E 112. Embedded Systems**  
**4 Credits (3+3P)**

Introduction to programming through microcontroller-based projects. Extensive practice in writing computer programs to solve engineering problems with microcontrollers, sensors, and other peripheral devices.

**Prerequisite(s):** C- or better in E E 100.

**E E 200. Linear Algebra, Probability and Statistics Applications**  
**4 Credits (3+3P)**

The theory of linear algebra (vectors and matrices) and probability (random variables and random processes) with application to electrical engineering. Computer programming to solve problems in linear algebra and probability.

**Prerequisite(s):** C- or better in E E 112 and MATH 192G.

**E E 201. Electric Circuit Analysis**  
**3 Credits**

Electric component descriptions and equations. Kirchhoff's voltage and current laws, formulation and solution of RLC network equations using time domain concepts. For nonmajors only. Minimum 2.0 GPA.

**Prerequisite(s):** C or better in MATH 192G.

**E E 212. Introduction to Computer Organization**  
**4 Credits (3+3P)**

Concepts of modern computer organization, CPU control, pipelining, memory hierarchies, memory mapping, hardware-software interface, and operating systems.

**Prerequisite(s):** C- or better in E E 112 and MATH 190G.

**E E 230. AC Circuit Analysis and Introduction to Power Systems**  
**4 Credits (3+3P)**

Electric component descriptions and equations; complete solutions of RLC circuits; steady-state analysis of AC circuits; application to power system analysis. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 216G. **Prerequisite(s):** C- or better in E E 100 and MATH 192G.

**E E 240. Multivariate and Vector Calculus Applications**  
**3 Credits**

Vector algebra, cylindrical and spherical coordinates, partial derivatives, multiple integrals. Calculus of vector functions through electrostatic applications. Divergence, gradient, curl, divergence theorem, Stokes's theorem, Coulomb's Law, Gauss's Law, electric field, electric potential. Applications in Matlab.

**Prerequisite(s):** C- or better in MATH 192G and E E 112.

**E E 300. Cornerstone Design**  
**2 Credits**

Application and realization of engineering principles to a guided team-based design project. Formulation and implementation of test procedures, evaluation of alternate solutions and oral and written communication of the design and test results. Restricted to: E E majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** C- or better in E E 212 and E E 230.

**E E 317. Semiconductor Devices and Electronics I**  
**4 Credits (3+3P)**

Analysis and design of opamp circuits, diode circuits and single-transistor MOS and BJT amplifiers. Introduction to solid-state semiconductor devices.

**Prerequisite(s):** C- or better in E E 230 and CHEM 111G.

**E E 320. Signals and Systems I**  
**3 Credits**

Introduction to the modeling and analysis of continuous- and discrete-time signals and systems using time- and frequency-domain methods suitable for both mathematical approaches and computer-aided simulations. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. **Prerequisite(s):** C- or better in E E 200 and E E 230.

**E E 325. Signals and Systems II**  
**4 Credits (3+3P)**

Introduction to communication systems including amplitude and frequency modulation. Introduction to control systems including linear feedback systems, root-locus analysis, and graphical representations. Introduction to digital signal processing including sampling, digital filtering, and spectral analysis. May be repeated up to 4 credits.

**Prerequisite(s):** C- or better in E E 320 and MATH 392.

**E E 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radio-active waste management provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 330, G EN 330, I E 330, M E 330, WERC 330, A EN 330 and CH E 330

**E E 340. Fields and Waves****4 Credits (3+3P)**

Static electromagnetic field. Maxwell's equation and time-varying electromagnetic fields. Generalized plane wave propagation, reflection, transmission, superposition and polarization. Transmission line theory. Extensions to optical wave propagation. Applications including Time Domain Reflectometry (TDR) and fiber optic transmission. Laboratory experience with RF/microwave test equipment and optical apparatus.

**Prerequisite(s):** C- or better in E E 230, E E 240 and PHYS 216.

**E E 391. Introduction to Electric Power Engineering****4 Credits (3+3P)**

Introduction to the principles, concepts, and analysis of the major components of an electric power system. Basic electromechanics, energy conversion and source conversion, transformers, transmission lines, rectifiers, regulators, and system analysis.

**Prerequisite(s):** C or better in E E 280.

**E E 395. Introduction to Digital Signal Processing****4 Credits (3+3P)**

Undergraduate treatment of sampling/reconstruction, quantization, discrete-time systems, digital filtering, z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications. Laboratory will emphasize practical implementation of signal processing including real-time signal processing. May be repeated up to 4 credits.

**Prerequisite(s):** C- or better in E E 325.

**E E 400. Undergraduate Research****1-3 Credits**

Directed undergraduate research. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of the department head.

**E E 402. Capstone Design****3 Credits (2+3P)**

Application and realization of engineering principles to a significant team-based design project with significant student management and autonomy. Determination of performance requirements, including safety, economics, ethics and manufacturability; extensive communication of design choices and test results to broad audiences; and interfacing of design with other hardware and software. May be repeated up to 3 credits. Restricted to: E E majors.

**Prerequisite(s):** C- or better in E E 300, E E 317, E E 325, and E E 340.

**E E 412. ASIC Design****3 Credits**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Crosslisted with: E E 512.

**Prerequisite(s)/Corequisite(s):** E E 480.

**E E 418. Capstone Design I****3 Credits (1+6P)**

Application of engineering principles to a significant design project. Includes teamwork, written and oral communications, and realistic technical, economic, and public safety requirements.

**Prerequisite(s)/Corequisite(s):** E E 461. Prerequisite(s): C or better in E E 260, E E 314, E E 351, E E 380, and E E 391.

**E E 419. Capstone Design II****3 Credits (1+6P)**

Realization of design project from E E 418 within time and budget constraints.

**Prerequisite(s)/Corequisite(s):** E E 461. Prerequisite(s): (C or better in E E 260, E E 314, E E 351, E E 380, and E E 391) OR (C or better in E E 418).

**E E 425. Introduction to Semiconductor Devices****3 Credits**

Energy bands, carriers in semiconductors, junctions, transistors, and optoelectronic devices, including light-emitting diodes, laser diodes, photodetectors, and solar cells. Taught with E E 525.

**Prerequisite(s):** C or better in E E 380 and E E 351.

**E E 426. Introduction to Smart Grid****3 Credits**

The course will serve as an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Taught with E E 546. Crosslisted with: C S 494.

**Prerequisite(s):** C- or better in E E 280.

**E E 431. Power Systems II****3 Credits**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Crosslisted with: E E 542.

**Prerequisite(s)/Corequisite(s):** E E 431 L. Prerequisite(s): C- or better in E E 230.

**E E 431 L. Power Systems II Laboratory****1 Credit**

Laboratory for Power Systems II. Crosslisted with: E E 542 L.

**Prerequisite(s)/Corequisite(s):** E E 431.

**E E 432. Power Electronics****3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems.

**Prerequisites:** C or better in E E 380 and E E 391.

**Corequisites:** E E 312 and E E 314.

**E E 443. Mobile Application Development****3 Credits**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. May be repeated up to 3 credits.

**Prerequisite(s):** C- or better in C S 172 or C S 177 or C S 187 or C S 271 or C S 451 or C S 452.

**E E 444. Advanced Image Processing****3 Credits**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Crosslisted with: E E 588.

**Prerequisite(s):** C- or better in E E 446.

**E E 446. Digital Image Processing****3 Credits**

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Taught with E E 596. **Prerequisite(s):** E E 395

**E E 447. Neural Signal Processing****3 Credits**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package that sits on top of Matlab. Taught with E E 597.

**Prerequisite(s):** C- or better in E E 314.

**E E 449. Smart Antennas****3 Credits**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive mean square, sidelobe cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 549.

**Prerequisite(s):** C or better in E E 314 and E E 351.

**E E 452. Introduction to Radar****3 Credits**

Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Taught with E E 548. Restricted to undergraduate students. Pre/

**Prerequisite(s):** C or better in E E 210 and E E 351.

**Corequisite(s):** E E 496.

**E E 453. Microwave Engineering****3 Credits**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521. Restricted to undergraduate students. Restricted to: Main campus only.

**Prerequisite(s):** C or better in E E 351.

**E E 454. Antennas and Radiation****4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Crosslisted with: E E 541.

**Prerequisite(s):** C- or better in E E 340.

**E E 460. Space System Mission Design and Analysis****3 Credits**

Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems.

**Prerequisite:** junior standing.

**E E 461. Systems Engineering and Program Management****3 Credits**

Modern technical management of complex systems using satellites as models. Team projects demonstrate systems engineering disciplines required to configure satellite components.

**Prerequisite(s):** Junior standing.

**E E 462. Computer Systems Architecture****4 Credits (3+3P)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Crosslisted with: E E 562.

**Prerequisite(s):** C- or better in E E 212.

**E E 467. ARM SOC Design****3 Credits**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Crosslisted with: E E 567.

**Prerequisite(s):** C- or better in E E 212 and E E 317.

**E E 469. Communications Networks****3 Credits (2+3P)**

Introduction to the design and performance analysis of communications networks with major emphasis on the Internet and different types of wireless networks. Covers network architectures, protocols, standards and technologies; design and implementation of networks; networks applications for data, audio and video; performance analysis. Taught with E E 569.

**Prerequisite(s):** C or better in E E 162 and (E E 210 or STAT 371).

**E E 473. Introduction to Optics****4 Credits (3+3P)**

The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Crosslisted with: PHYS 473.

**Prerequisite(s):** PHYS 216 or PHYS 217.

**E E 475. Automatic Control Systems****4 Credits (3+3P)**

Mathematical modeling of physical control systems in form of differential equations, transfer functions, and state-variables. System performance indices of feedback control systems via classical frequency-domain techniques and time-domain methods. Computer-aided solution of real-world design problems.

**Prerequisite(s):** C- or better in E E 325.

**E E 476. Computer Control Systems****3 Credits**

Representation, analysis and design of discrete-time systems using time-domain and z-domain techniques. Microprocessor control systems.

**Prerequisite:** C or better in E E 314.

**E E 478. Fundamentals of Photonics****4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures.

Taught with E E 528. Recommended foundation: E E/PHYS 473.

Crosslisted with: PHYS 478.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**E E 479. Lasers and Applications****4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Taught with E E 529. Crosslisted with: PHYS 479

**Prerequisite(s):** C or better in E E 351 or PHYS 461.

**E E 480. Introduction to Analog and Digital VLSI****4 Credits (3+3P)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication and CAD tools. Crosslisted with: E E 510.

**Prerequisite(s):** C- or better in E E 260 and E E 380.

**E E 482. Electronics II****3 Credits**

Feedback analysis, application of operational amplifiers, introduction to data converters, analog filters, oscillator circuits..

**Prerequisite:** C or better in E E 380.

**E E 485. Analog VLSI Design****3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523. Restricted to undergraduate students. Restricted to: Main campus only.

**Prerequisite(s):** C or better in E E 312 and E E 480.

**E E 486. Digital VLSI Design****3 Credits**

An introduction to VLSI layers. Static and dynamic logic design, memory circuits, arithmetic operators, and digital phase-locked loops. Taught with E E 524. Restricted to undergraduate students.

**Prerequisite(s):** C or better in E E 260 and E E 380.

**E E 486 L. Digital VLSI Design Laboratory****1 Credit**

Simulation, schematic capture, layout, and verification using software tools of material presented in E E 486. An introduction to measurement of digital VLSI circuits. Taught with E E 524L. Pre/

**Prerequisite(s):** C or better in E E 260 and E E 380.

**Corequisite(s):** E E 486.

**E E 490. Selected Topics****1-3 Credits**

May be repeated for a maximum of 9 credits. Graduate students may not use credits of E E 490 toward an M.S. or Ph.D. in electrical engineering.

**Prerequisite:** consent of instructor.

**E E 493. Power Systems III****3 Credits**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543. Restricted to undergraduate students. Pre/

**Prerequisite(s):** C or better in E E 391.

**Corequisite(s):** E E 431.

**E E 496. Introduction to Communication Systems****4 Credits (3+3P)**

Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems.

**Prerequisite(s):** C or better in E E 314.

**E E 497. Digital Communication Systems I****3 Credits**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Taught with E E 581. Recommended foundation: E E 496.

**Prerequisite(s):** E E 210 and E E 314.

**E E 501. Research Topics in Electrical and Computer Engineering****1 Credit**

Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering.

**E E 510. Introduction to Analog and Digital VLSI****4 Credits (3+3P)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication and CAD tools. Recommended preparation is E E 260 and E E 380 or equivalent. Taught with E E 480 with differentiated assignments for graduate students. Crosslisted with: E E 480.

**E E 512. ASIC Design****3 Credits**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Recommended foundation is E E 480. Crosslisted with: E E 412.

**E E 514. Biosensor Electronics****3 Credits**

Course provides students with knowledge of basic integrated analog and RF blocks and how to combine these circuits into sensory systems for biomedical applications. Target areas are in physiology, brain-machine interfaces, neural recording and stimulation. Lecture includes details on amplifiers, current-mode circuits, A/D converters, low-power radio transmitters and receivers, and simulation and layout of VLSI circuits. Lectures are in the form of recent paper reviews and discussion. Includes teamwork, written and oral communication, and realistic technical requirements. Pre/

**Prerequisite(s):** E E 486 OR E E 524.

**Corequisite(s):** E E 485 OR E E 523.

**E E 515. Electromagnetic Theory I****3 Credits**

Electromagnetic theory of time-harmonic fields in rectangular, cylindrical and spherical coordinates with applications to guided waves and radiated waves. Induction and equivalence theorems, perturbational and variational principles applied to engineering problems in electromagnetics. Recommended preparation is E E 351 or equivalent. Restricted to: Main campus only.

**E E 516. Electromagnetic Theory II****3 Credits**

Continuation of E E 515.

**E E 518. Integrated Power Management Circuits****3 Credits**

Design and analysis of power management integrated circuits, including linear voltage regulators, voltage references, buck, boost, and buck-boost DC-DC converters, and charge pumps. Extensive use of CAD tools are used to simulate these circuits. Pre/

**Prerequisite(s):** E E 486 or E E 524.

**Corequisite(s):** E E 485 or E E 523.

**E E 519. RF Microelectronics****3 Credits**

Knowledge of modern Radio Frequency CMOS integrated circuits, Basic Concepts in RF Design, Communication Concepts, Transceiver Architectures, Low Noise Amplifiers, Mixers, Passive Device in RF Designs, Oscillators, Phase-Locked Loops, Frequency Synthesizers, Power Amplifiers, and State-of-the-art RF systems and applications.

**Prerequisite(s):** E E 485 or E E 523.

**E E 520. A/D and D/A Converter Design****3 Credits**

Practical design of integrated data converters in CMOS/BJT technologies, OP-AMPS, comparators, sample and holds, MOS switches, element mismatches. Nyquist rate converter architectures: flash, successive approximation, charge redistribution, algorithmic, two step, folding, interpolating, pipelined, delta-sigma converters. Restricted to: Main campus only.

**Prerequisite(s):** E E 523.

**E E 521. Microwave Engineering****3 Credits**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Recommended preparation is E E 351 or equivalent. Taught with E E 453 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 522. Advanced Analog VLSI Design****3 Credits**

Design of high-performance operational amplifiers; class-AB, rail-to-rail, low-voltage, high-bandwidth, fully-differential. Design of linear operational transconductance amplifiers, high-frequency integrated filters, four-quadrant multipliers, and switched-capacitor circuits.

**Prerequisite(s):** E E 523.

**E E 523. Analog VLSI Design****3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended preparation is E E 312 and E E 480 or equivalent. Taught with E E 485 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 524. Digital VLSI Design****3 Credits**

An introduction to VLSI layers. Static and dynamic logic design, memory circuits, arithmetic operators, and digital phase-locked loops. Taught with E E 486 with differentiated assignments for graduate students.

Recommended foundation: E E 260 and E E 380.

**E E 524 L. Digital VLSI Design Laboratory****1 Credit**

Simulation, schematic capture, layout, and verification using software tools of material presented in E E 524. An introduction to measurement of digital VLSI circuits. Taught with E E 486L with differentiated assignments for graduate students.

**E E 525. Introduction to Semiconductor Devices****3 Credits**

Energy bands, carriers in semiconductors, junctions, transistors, and optoelectronic devices, including light-emitting diodes, laser diodes, photodetectors, and solar cells. Recommended preparation is E E 380 and E E 351. Taught with: E E 425 with differentiated assignments for graduate students.

**E E 528. Fundamentals of Photonics****4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 478 with differentiated assignments for graduate students. Recommended foundation: (PHYS 216 or PHYS 217) and E E / PHYS 473. Crosslisted with: PHYS 528.

**E E 529. Lasers and Applications****4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Recommended foundation: E E 351 or PHYS 461. Taught with: E E 479 with differentiated assignments for graduate students. Crosslisted with: PHYS 529

**E E 530. Environmental Management Seminar I****1 Credit**

Same as CH E 530, C E 530, I E 530.

**E E 531. Power System Modeling and Computational Methods****3 Credits**

Development and analysis of fast computational methods for efficient solution of large scale power-system problems. Algorithms for constructing the bus impedance matrix; sparse matrix techniques; partial-inverse methods; compensation of mutual coupling. Pre/ Restricted to: Main campus only.

**Corequisite(s):** E E 543.

**E E 532. Dynamics of Power Systems****3 Credits**

Transient and dynamic stability of power systems; synchronous machine modeling and dynamics; prediction and stabilization of system oscillations. Recommended preparation is E E 493 or equivalent. Restricted to: Main campus only.

**E E 533. Power System Operation****3 Credits**

AGC, economic dispatch, unit commitment, operations planning, power flow analysis and network control, system control centers. Recommended preparation is E E 493 or equivalent. Restricted to: Main campus only.

**E E 534. Power System Relaying****3 Credits**

Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended preparation is E E 493 or equivalent.

**E E 537. Power Electronics****3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended preparation is E E 314, E E 380, and E E 391. Taught with E E 432 with differentiated assignments for graduate students.

**E E 541. Antennas and Radiation****4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended foundation is E E 340. Crosslisted with: E E 454.

**E E 542. Power Systems II****3 Credits**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended foundation is E E 230.

Crosslisted with: E E 431.

**E E 542 L. Power Systems II Laboratory****1 Credit**

Laboratory for Power Systems II. Crosslisted with: E E 431 L.

**Prerequisite(s)/Corequisite(s):** E E 542.

**E E 543. Power Systems III****3 Credits**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended preparation is E E 431 or equivalent. Taught with E E 493 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 544. Distribution Systems****3 Credits**

Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended preparation is E E 542 and E E 543. Taught with E E 494 with differentiated assignments for graduate students.

**E E 545. Digital Signal Processing II****3 Credits**

Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended preparation is E E 395 or equivalent. Restricted to: Main campus only.

**E E 546. Introduction to Smart Grid****3 Credits**

The course will serve as an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Taught with E E 426. Crosslisted with: C S 514.

**E E 548. Introduction to Radar****3 Credits**

Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended preparation is E E 310, E E 351, and E E 496 or equivalent. Taught with E E 452 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 549. Smart Antennas****3 Credits**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobe cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 449. Recommended foundation is E E 314 and E E 351.

**E E 551. Control System Synthesis I****3 Credits**

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems.

**E E 552. Control System Synthesis II****3 Credits**

An overview of optimal controls for linear dynamical systems, analysis and design of control systems using Lyapunov techniques, control system design using semidefinite programming. An introduction to stochastic filtering and control.

**E E 562. Computer Systems Architecture****4 Credits (3+3P)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended foundation is E E 212. Crosslisted with: E E 462.

**E E 563. Computer Performance Analysis I****3 Credits**

Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 210 and E E 363.

**E E 564. Advanced Computer Architecture I****3 Credits**

Multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended preparation is E E 363 or equivalent. Crosslisted with: C S 573.

**E E 565. Pattern Recognition and Machine Learning****3 Credits**

Statistical pattern classification, supervised and unsupervised learning, feature selection and extraction, clustering, image classification and syntactical pattern recognition. Recommended preparation is E E 210 or equivalent probability and statistics and linear algebra courses.

**E E 567. ARM SOC Design****3 Credits**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Recommended foundation is E E 212 and E E 317. Crosslisted with: E E 467.

**E E 569. Communications Network****3 Credits (2+3P)**

Introduction to the design and performance analysis of communications networks with major emphasis on the Internet and different types of wireless networks. Covers network architectures, protocols, standards and technologies; design and implementation of networks; networks applications for data, audio and video; performance analysis. Taught with E E 469. Recommended foundation is E E 162 and (E E 210 or STAT 371).

**E E 571. Random Signal Analysis****3 Credits**

Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems.

**E E 572. Modern Coding Theory****3 Credits**

Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation is E E 210 and E E 496.

**E E 573. Signal Compression****3 Credits**

Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing.

**Prerequisite:** E E 571.

**E E 577. Fourier Methods in Electro-Optics****3 Credits**

Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 312 and E E 528. Crosslisted with: PHYS 577

**E E 578. Optical System Design****3 Credits**

Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E/PHYS 473, E E/PHYS 528 and E E/PHYS 577. Crosslisted with: PHYS 578.

**E E 581. Digital Communication Systems I****3 Credits**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation is E E 210, E E 314, and E E 496. Taught with E E 497.

**E E 583. Wireless Communication****3 Credits**

Cellular networks, wireless channels and channel models, modulation and demodulation, MIMO, diversity and multiplexing, OFDM, wireless standards including LTE and WiMAX. Recommended foundation: E E 571 or equivalent.

**Prerequisite(s):** E E 314 or E E 571.

**E E 584. Mathematical Methods for Communications and Signal Processing****3 Credits**

Applications of mathematical techniques from estimation theory, optimization principles and numerical analysis to the problems in communications and signal processing.

**Prerequisites:** E E 571 and E E 555 or knowledge of linear algebra.

**E E 585. Telemetry Systems****3 Credits**

Covers the integration of components into a command and telemetry system. Topics include analog and digital modulation formats, synchronization, link effects, and applicable standards. Recommended preparation is E E 395, E E 496, and E E 497, or equivalent. Restricted to: Main campus only.

**E E 586. Information Theory****3 Credits**

This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Restricted to: Main campus only. Crosslisted with: MATH 509

**Prerequisite(s):** E E 571 or STAT 515.

**E E 588. Advanced Image Processing****3 Credits**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Crosslisted with: E E 444.

**Prerequisite(s):** E E 446 or E E 596.

**E E 590. Selected Topics****1-9 Credits**

May be repeated for a maximum of 18 credits.

**E E 593. Mobile Application Development****3 Credits**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. Taught with E E 443 with differentiated assignments for graduate students. Recommended foundation is C++ or Java programming course. May be repeated up to 3 credits.

**E E 596. Digital Image Processing****3 Credits**

Two-dimensional transform theory, color images, image enhancement, restoration, registration, segmentation, compression and understanding. Recommended foundation is E E 571. Taught with E E 446.

**E E 597. Neural Signal Processing****3 Credits**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package that sits on top of Matlab. Taught with E E 447.

**E E 598. Master's Technical Report****9 Credits**

Individual investigation, either analytical or experimental, culminating in a technical report. May be repeated for a maximum of 18 credits. Graded PR/S/U.

**E E 599. Master's Thesis****15 Credits**

Thesis.

**E E 600. Doctoral Research****1-15 Credits**

Research.

**E E 615. Computational Electromagnetics****3 Credits**

The numerical solution of electromagnetics problems. Topics include differential equation techniques, integral equation methods, hybrid techniques, algorithm development and implementation, and error analysis. Particular algorithms, including FEM, finite differences, direct solvers, and iterative solvers, are studied.

**E E 690. Selected Topics****1-9 Credits**

May be repeated for a maximum of 9 credits.

**E E 700. Doctoral Dissertation****15 Credits**

Dissertation.

**Name:** The Klipsch School of Electrical and Computer Engineering

**Office Location:** Thomas and Brown Hall, Rm 106

1125 Frenger Mall

Las Cruces, NM 88003

**Phone:** (575) 646-3115

**Website:** <http://ece.nmsu.edu/>

# Electrical Engineering - Bachelor of Science in Electrical Engineering

## Electrical Engineering Program Educational Objectives

The Klipsch School is dedicated to providing a quality, hands-on, educational experience for our students. Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

**Requirements (120 credits)****General Education****State of New Mexico Common Core***Area I: Communications*

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective <sup>1</sup>		3

Oral Communications Elective <sup>1</sup>		3
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*Area II: Mathematics*

MATH 191G	Calculus and Analytic Geometry I	4
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*Area III: Natural Science*

CHEM 111G	General Chemistry I	4
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PHYS 215G	Engineering Physics I	3
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PHYS 215GL	Engineering Physics I Laboratory	1
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*Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts*

Select 15 total credits from Area IV and V, with at least 6 credits from each area: <sup>1</sup>		15
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*Area IV: Social and Behavioral Sciences:*

Select 6-9 credits from Economics, Political Science, Psychology, Sociology, and Anthropology electives<sup>1</sup>

*Area V: Humanities and Fine Arts:*

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, or Foreign Language electives<sup>1</sup>

**Institution Specific General Education**

Viewing a Wider World Electives (PHIL 323V strongly recommended) <sup>1</sup>		6
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**Program Specific Requirements***Mathematics and Natural Science*

MATH 192G	Calculus and Analytic Geometry II	4
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MATH 392	Introduction to Ordinary Differential Equations	3
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PHYS 216G	Engineering Physics II	3
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PHYS 216GL	Engineering Physics II Laboratory	1
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E E 200	Linear Algebra, Probability and Statistics Applications	4
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E E 240	Multivariate and Vector Calculus Applications	3
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*STEM*

Select one course from STEM electives <sup>2</sup>		3
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*Electrical and Computer Engineering*

ENGR 100	Introduction to Engineering	3
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E E 100	Introduction to Electrical and Computer Engineering	4
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E E 112	Embedded Systems	4
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E E 212	Introduction to Computer Organization	4
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E E 230	AC Circuit Analysis and Introduction to Power Systems	4
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E E 300	Cornerstone Design	2
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E E 317	Semiconductor Devices and Electronics I	4
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E E 320	Signals and Systems I	3
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E E 325	Signals and Systems II	4
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E E 340	Fields and Waves	4
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E E 402	Capstone Design	3
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E E Concentration Courses (14 or 15 cr) <sup>3</sup>		14
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*Object-Oriented Programming*

Select one course from the following (3 or 4 cr):		3
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C S 151 C++ Programming

C S 152 Java Programming

C S 154 Python Programming II

C S 172 Computer Science I

C S 271	Object Oriented Programming	
Total Credits		120

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<http://ece.nmsu.edu/undergraduate/bsee-stem-electives>).

<sup>3</sup> For a list of approved E E Concentration Courses, see below.

## Concentration Courses

Undergraduate students are given the opportunity to specialize in one concentration area. Once fulfilled, this concentration appears on the student's transcript. Concentrations include a minimum of 11 credits hours of coursework in:

- Communications and Signal Processing
- Computers and Microelectronics
- Control and Power
- Electromagnetics and Photonics
- Space Systems

Alternately, students can elect to have no concentration. In this case students are required to complete 14 or 15 credits hours, which includes one required course from three different concentrations, plus a second STEM elective.

### Concentration: Communications and Signal Processing (14 credits)

*Required:*

E E 395	Introduction to Digital Signal Processing	4
E E 496	Introduction to Communication Systems	4

*Choose two, such that at least one has E E prefix:* 6

E E 446	Digital Image Processing	
E E 447	Neural Signal Processing	
E E 460	Space System Mission Design and Analysis	
E E 469	Communications Networks	
E E 497	Digital Communication Systems I	
C S 343	Algorithm Design & Implementation	
C S 372	Data Structures and Algorithms	
C S 453	Python Programming I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 483	Introduction to Robotics	
C S 486	Bioinformatics	
MATH 471	Complex Variables	
MATH 472	Fourier Series and Boundary Value Problems	
MATH 473	Calculus of Variations and Optimal Control	

MATH 480	Matrix Theory and Applied Linear Algebra	
MATH 481	Advanced Linear Algebra	
MATH 491	Introduction to Real Analysis I	
STAT 470	Probability: Theory and Applications	

Total Credits 14

### Concentration: Computers and Microelectronics (14 credits)

*Required:*

E E 462	Computer Systems Architecture	4
E E 480	Introduction to Analog and Digital VLSI	4

*Choose two, such that at least one has E E prefix:* 6

E E 412	ASIC Design	
E E 425	Introduction to Semiconductor Devices	
E E 443	Mobile Application Development	
E E 467	ARM SOC Design	
E E 469	Communications Networks	
E E 482	Electronics II	
E E 485	Analog VLSI Design	
E E 486	Digital VLSI Design	
CHME 467	Nanoscience and Nanotechnology	
C S 343	Algorithm Design & Implementation	
C S 370	Compilers and Automata Theory	
C S 371	Software Development	
C S 372	Data Structures and Algorithms	
C S 453	Python Programming I	
C S 474	Operating Systems I	
C S 478	Computer Security	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 482	Database Management Systems I	
C S 491	Parallel Programming	

Total Credits 14

### Concentration: Control and Power (14 credits)

*Required:*

E E 431	Power Systems II	4
& 431 L	and Power Systems II Laboratory	
E E 475	Automatic Control Systems	4

*Choose two, such that at least one has E E prefix:* 6

E E 426	Introduction to Smart Grid	
E E 432	Power Electronics	
E E 476	Computer Control Systems	
E E 493	Power Systems III	
CHME 361	Engineering Materials	
M E 481	Alternative and Renewable Energy	
M E 487	Mechatronics	
C S 343	Algorithm Design & Implementation	
C S 483	Introduction to Robotics	
MATH 480	Matrix Theory and Applied Linear Algebra	

Total Credits 14

### Concentration: Electromagnetics and Photonics (14 credits)

*Required:*

E E 454	Antennas and Radiation	4
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E E 473	Introduction to Optics	4
<i>Choose two, such that at least one has E E prefix:</i>		6
E E 425	Introduction to Semiconductor Devices	
E E 449	Smart Antennas	
E E 452	Introduction to Radar	
E E 453	Microwave Engineering	
E E 478	Fundamentals of Photonics	
E E 479	Lasers and Applications	
CHME 311	Engineering Data Analysis	
CHME 467	Nanoscience and Nanotechnology	
M E 328	Engineering Analysis II	
ASTR 402	Introduction to Astronomical Observations and Techniques	
MATH 471	Complex Variables	
MATH 472	Fourier Series and Boundary Value Problems	
MATH 480	Matrix Theory and Applied Linear Algebra	
PHYS 315	Modern Physics	
PHYS 471	Modern Experimental Optics	
Total Credits		14

**Concentration: Space Systems (14 credits)***Required:*

E E 460	Space System Mission Design and Analysis	3
A E 362	Orbital Mechanics	3
<i>Choose two:</i>		8
E E 395	Introduction to Digital Signal Processing	
E E 454	Antennas and Radiation	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
E E 496	Introduction to Communication Systems	
Total Credits		14

**No Concentration (15 credits)***Choose three required 4-credit courses from 3 different concentrations:*

E E 395	Introduction to Digital Signal Processing	
or E E 496	Introduction to Communication Systems	
E E 462	Computer Systems Architecture	
or E E 480	Introduction to Analog and Digital VLSI	
E E 431 & 431 L	Power Systems II and Power Systems II Laboratory	
or E E 475	Automatic Control Systems	
E E 454	Antennas and Radiation	
or E E 473	Introduction to Optics	
<i>Choose a second STEM elective:<sup>1</sup></i>		3
Total Credits		15

<sup>1</sup> Second STEM Elective: A second course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<http://ece.nmsu.edu/undergraduate/bsee-stem-electives>).

## The Freshman Year

Incoming freshmen are expected to be eligible for MATH 191G Calculus and Analytic Geometry I. A typical first year of study for E E students includes the following 30 credits:

Course	Title	Credits
<b>Freshman</b>		
<b>Fall</b>		
E E 100	Introduction to Electrical and Computer Engineering	4
ENGR 100	Introduction to Engineering	3
ENGL 111G	Rhetoric and Composition	4
MATH 191G	Calculus and Analytic Geometry I <sup>1</sup>	4
Credits		15
<b>Spring</b>		
CHEM 111G	General Chemistry I	4
E E 112	Embedded Systems	4
MATH 192G	Calculus and Analytic Geometry II	4
General Education Requirement from either Area I or IV		3
Credits		15
Total Credits		30

<sup>1</sup> Eligibility for MATH 191G Calculus and Analytic Geometry I must be established with AP Calculus credit or by taking the Math Placement Exam, administered by the Math Learning Center.

## Related Areas of Study

Electrical and computer engineering students wishing to broaden their educational experience may elect to earn additional bachelor's degrees in

- Engineering Physics
- Computer Science
- Mathematics
- Physics

Klipsch School students may also choose to earn a minor in one or more of the following fields:

- Computer Engineering
- Computer Science
- Mathematics
- Physics

Students must consult with an academic advisor in the offering department for specific requirements related to additional degrees and minors.

## Dual Degree (BS/MS) Program

This program option is designed to provide a means for ECE undergraduates to obtain both a BSEE and a MSEE degree with 144

credit hours of coursework (normally: BSEE = 120 hours, MSEE = 30 hours; total =150 hours). Students electing this option will follow the existing undergraduate curriculum for the first six semesters. In the final undergraduate year, two graduate courses (>500 level) will be taken in lieu of two E E concentration courses. The student receives a BSEE degree at this point. A MSEE program can be completed with 24 additional credit hours. Students must obtain prior approval of the department before starting this program option.

## Transfer Credit

Credit earned at other institutions is generally accepted; however the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics must be calculus based.
- If the NMSU requirement includes a lab, the transfer credit must include a lab.
- A grade of C-, or better, must have been earned.
- E E Concentration Courses, Cornerstone and Capstone courses may not be transferred.
- Upper division E E core classes can only receive transfer credit after review and approval of the course area faculty.

## Computer Engineering - Undergraduate Minor (26-27 Credits)

### Prerequisites (All may be transferred)

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4

### Lower Division (all may be transferred)

E E 100	Introduction to Electrical and Computer Engineering	4
E E 112	Embedded Systems	4
or C S 273	Machine Programming and Organization	
E E 212	Introduction to Computer Organization	4
C S 271	Object Oriented Programming	4

### Upper Division (no transfer credits accepted)

E E 462	Computer Systems Architecture	3-4
or C S 473	Architectural Concepts I	
C S 371	Software Development	4
C S 484	Computer Networks I	3
or E E 469	Communications Networks	

Total Credits 26-27

## Electrical Engineering - Undergraduate Minor (26 Credits)

The Electrical Engineering minor is not available to students majoring in Electrical Engineering.

### Prerequisites (all may be transferred)

CHEM 111G	General Chemistry I	4
MATH 191G	Calculus and Analytic Geometry I	4

MATH 192G	Calculus and Analytic Geometry II	4
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 215G	Engineering Physics I	3
PHYS 216G	Engineering Physics II	3

### Lower Division (all may be transferred)

E E 100	Introduction to Electrical and Computer Engineering	4
E E 112	Embedded Systems	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 230	AC Circuit Analysis and Introduction to Power Systems	4

### Upper Division (no transfer credit accepted)

E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3

### E E Elective (Select one of the following, 3 or 4 credits)

E E 325	Signals and Systems II	3
E E 340	Fields and Waves <sup>2</sup>	
E E 425	Introduction to Semiconductor Devices	
E E 426	Introduction to Smart Grid	
E E 431 & 431 L	Power Systems II and Power Systems II Laboratory	
E E 432	Power Electronics	
E E 443	Mobile Application Development	
E E 460	Space System Mission Design and Analysis	
E E 462	Computer Systems Architecture <sup>1</sup>	
E E 467	ARM SOC Design <sup>1</sup>	
E E 469	Communications Networks	
E E 473	Introduction to Optics	
E E 480	Introduction to Analog and Digital VLSI	
E E 482	Electronics II	

Total Credits 26

<sup>1</sup> E E 212 Computer Organization additional pre-requisite.

<sup>2</sup> E E 240 Multivariate and Vector Calculus Applications additional pre-requisite.

## Electrical Engineering - Master of Science in Electrical Engineering Requirements and Options for M.S.E.E. Degree

The Program Educational Objectives for the Master of Science Program in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

Three options exist for the Master of Science in Electrical Engineering degree. The requirements for each option are listed below:

1. Thesis: 24 credits of course work plus 6 credits of E E 599 Master's Thesis plus oral exam
2. Technical Report: 27 credits of course work plus 3 credits of E E 598 Master's Technical Report plus oral exam
3. Course Work Only: 30 credits of course work plus passing three graduate core courses (or two graduate core courses and one graduate breadth course) with a B- or better in each course. No oral exam is required for the course work only option.

## Graduate Core Courses and Breadth Electives

The MSEE program requires students to participate in one semester of research seminars (E E 501 Research Topics in Electrical and Computer Engineering, 1 credit) and take two graduate core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth course must be taken from a third area of emphasis. If a student wishes to pursue a Ph.D., the third class should come from the core class list as preparation for the Ph.D. qualifying exam. The graduate core courses, specialty areas and credits are listed below for the Graduate Core Courses and the Graduate Breadth Electives.

### Graduate Core Courses

#### Graduate Core Courses

<i>Electromagnetics</i>		
E E 515	Electromagnetic Theory I	3
<i>Microelectronics/VLSI</i>		
E E 523	Analog VLSI Design	3
<i>Photonics</i>		
E E 528	Fundamentals of Photonics	4
or E E 529	Lasers and Applications	
<i>Electric Energy Systems</i>		
E E 543	Power Systems III	3
<i>Digital Signal Processing</i>		
E E 545	Digital Signal Processing II	3
<i>Control Systems</i>		
E E 551	Control System Synthesis I	3
<i>Computer Engineering</i>		
E E 563	Computer Performance Analysis I	3
or E E 564	Advanced Computer Architecture I	
<i>Communications</i>		
E E 571	Random Signal Analysis	3
Total Credits		25

### Graduate Breadth Electives

#### Graduate Breadth Electives

<i>Microelectronics/VLSI</i>		
E E 512	ASIC Design	3
<i>Electric Energy Systems</i>		
E E 537	Power Electronics	3
<i>Electromagnetics</i>		
E E 541	Antennas and Radiation	4
<i>Digital Signal Processing</i>		

E E 585	Telemetry Systems	3
<i>Communications</i>		
E E 581	Digital Communication Systems I	3

## Excluded Courses

Credits from the following courses do not count toward an M S E E degree:

C S 450	C Programming	3
C S 451	C++ Programming	3
C S 452	Java Programming	3
C S 453	Python Programming I	3
C S 455	Internet Programming I	3
C S 458	R Programming I	3
C S 460	Computer Science I Transition	3
C S 462	Object Oriented Programming Transition	3
C S 463	Introduction to Data Structures Transition	3
C S 464	Machine Programming and Organization Transition	3
C S 465	Discrete Math for Computer Science Transition	3
C S 466	Compilers and Automata Transition	3
C S 468	Software Development Transition	3
C S 469	Data Structure and Algorithms Transition	3
COMM 485	International Teaching Assistant Development	3
E E 490	Selected Topics	1-3
SPCD 458	Advanced Speaking and Listening for International Graduate Students	3
SPCD 470	Scholarly Writing for International Graduate Students	3

Credits of E E 590 Selected Topics, are limited to a total of 9, of which at most 6 may be credits for courses that don't appear as regular classes in the printed schedule. Each area of specialization may have additional requirements for students in those areas. Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

## Electrical Engineering - Doctor of Philosophy

### Requirements for Ph.D. Degree

The Program Educational Objectives for the Doctorate in Electrical Engineering are:

1. That graduates obtain relevant, productive employment performing research in academia, government or industry, and/or are teaching at institutions of higher education.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree.

### Option 1 - Ph.D. with Completed MS Degree

1. Complete undergraduate deficiency coursework, if the student admitted has both master's and bachelor's degrees in fields other than electrical engineering. Complete graduate deficiency coursework, which consists of three graduate core courses from three different areas of emphasis, if the student has a master's degree in a field other than electrical engineering.
2. Complete a minimum of 18 credits beyond the master's of graduate course work with the following restrictions:
  - a. E E courses must be numbered 500 or higher. Non-E E courses must be 450 or higher.
  - b. At least half of the 18 credits must be taken in the Klipsch School (E E).
  - c. At most 6 credits may be research, for example, E E 600 Doctoral Research, and E E 590 Selected Topics courses that are not listed as regular courses in the schedule.
  - d. Exclude credits of E E 700 Doctoral Dissertation.
  - e. If the MS degree is not E E, exclude credits from graduate deficiency coursework.

### Option 2 - Direct Ph.D. with BSEE or Equivalent, but no MS Degree

1. Complete three graduate core courses.
2. Complete a minimum of 42 credits of graduate coursework, including the three graduate core courses with the following restrictions:
  - a. At least half of the 42 credits must be numbered 500 or higher.
  - b. At least half of the 42 credits must be taken in the Klipsch School (E E).
  - c. At most 9 credits may be research, for example, E E 600 Doctoral Research, and E E 590 Selected Topics courses that are not listed as regular courses in the schedule.
  - d. Exclude credits of E E 700 Doctoral Dissertation.
  - e. Courses excluded from the MSEE are also excluded from the Ph.D. program.
  - f. At least half of the credits must be taken with other than a single professor.

### Common Requirements for all Ph.D. Candidates

1. Participate in one semester of research seminars (E E 501 Research Topics in Electrical and Computer Engineering, 1 credits)
2. Take and pass the Ph.D. qualifying exam.
3. Pass a comprehensive examination. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. It may cover course work, include a proposal for dissertation research, and may be preceded by a written exam.
4. Complete 18 credits of E E 700 Doctoral Dissertation.
5. Submit evidence for a minimum of two publications related to the dissertation research, one of which is submitted to an internationally-recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference. Submissions must be completed prior to the final oral exam.<sup>1</sup>

6. Pass a final oral exam which defends the dissertation.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

### Ph.D. Qualifying Exam

The Ph.D. Qualifying Exam is typically offered on the Monday just prior to the beginning of each semester. The format is one half day written exam. The examination indicates a readiness for research at the graduate level. Students answer a total of six questions with two coming from each of three areas of emphasis. Taking three graduate core courses (listed listed in the MSEE program) prepares students for the Ph.D. qualifying exam.

PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

## Digital Communications - Graduate Certificate

Digital Communications focuses on the problem of transmitting information from one place to another through some medium (e.g., RF wireless). This certificate introduces students to the basic theory as well as the application of that theory.

A 3.0 minimum cumulative GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Deva Borah, International Foundation of Telemetry and Telecommunications Professor and Professor of the Klipsch School of Electrical and Computer Engineering, (575) 646-3357.

Required Courses		6
E E 571	Random Signal Analysis	
E E 581	Digital Communication Systems I	
<i>Electives (six credits from the following):</i>		6
E E 545	Digital Signal Processing II	
E E 569	Communications Network	
E E 572	Modern Coding Theory	
E E 573	Signal Compression	
E E 583	Wireless Communication	
E E 584	Mathematical Methods for Communications and Signal Processing	
E E 586	Information Theory	
Total Credits		12

## Digital Signal Processing - Graduate Certificate

Digital Signal Processing (DSP) focuses on the processing and analysis of digitized signals. This certificate introduces students to the basic theory as well as the application of that theory.

A 3.0 minimum cumulative GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Charles Creusere, Frank Carden Chair in Telecommunications and Telemetry and Professor of the Klipsch School of Electrical & Computer Engineering, (575) 646-3919.

Required Courses		6
E E 545	Digital Signal Processing II	
E E 571	Random Signal Analysis	
<i>Electives (six credits from the following):</i>		6
E E 565	Pattern Recognition and Machine Learning	
E E 573	Signal Compression	
E E 584	Mathematical Methods for Communications and Signal Processing	
E E 596	Digital Image Processing	
E E 597	Neural Signal Processing	
Total Credits		12

## Electric Energy Systems - Graduate Certificate

Electric Energy Systems in recent times has started to develop a cross-disciplinary aspect due to developments and investments in the area of renewables and smart electric grid. This trend is only likely to intensify over the years. Thus, addition to the engineers already working in the area of electric energy systems, engineers from other areas in electrical and computer engineering may feel the need to develop core knowledge in the area of Electric Energy Systems. This program provides such opportunity.

A 3.0 minimum GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Sukumar Brahma, Associate Director of the Electric Utility Management Program and Associate Professor of the Klipsch School of Electrical and Computer Engineering, (575) 646-7117.

Required Courses		6
E E 542	Power Systems II	
E E 543	Power Systems III	
<i>Electives (six credits from the following):</i>		6
E E 531	Power System Modeling and Computational Methods	
E E 532	Dynamics of Power Systems	
E E 533	Power System Operation	
E E 534	Power System Relaying	
E E 537	Power Electronics	
E E 544	Distribution Systems	
Total Credits		12

## Telemetry - Graduate Certificate

Telemetry is an applied discipline that uses concepts from communications, DSP, and computing to facilitate the transfer of sensed/measured data from one place to another over a typically wireless

channel. This certificate introduces students to the basic theory as well as the application of that theory.

A 3.0 minimum cumulative GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Charles Creusere, Frank Carden Chair in Telecommunications and Telemetry and Professor of the Klipsch School of Electrical & Computer Engineering, (575) 646-3919.

Required Courses		6
E E 545	Digital Signal Processing II	
E E 585	Telemetry Systems	
<i>Electives (six credits from the following):</i>		6
E E 569	Communications Network	
E E 571	Random Signal Analysis	
E E 572	Modern Coding Theory	
E E 573	Signal Compression	
E E 581	Digital Communication Systems I	
E E 583	Wireless Communication	
Total Credits		12

## Engineering Physics

### Undergraduate Program Information

The Engineering Physics program is offered jointly by the Department of Physics and the College of Engineering. The faculty is drawn from the Departments of Physics, Chemical and Materials Engineering, Electrical and Computer Engineering, and Mechanical & Aerospace Engineering.

### Degrees for the Department

Engineering Physics - Bachelor of Science in Engineering Physics (p. 601)

**Professor,** Stefan Zollner, Department Head

**Professor,** Heinz Nakotte, Engineering Physics Program Head

### Physics Courses

**PHYS 110G. The Great Ideas of Physics**

**4 Credits (3+3P)**

Conceptual, quantitative, and laboratory treatments of the great ideas and discoveries that have influenced lives and changed perceptions of nature, from Johannes Kepler's laws of planetary motion and Isaac Newton's and Albert Einstein's laws of motion and gravity to the modern concepts of the quantal structure of nature and the big bang universe.

**PHYS 120G. Introduction to Acoustics**

**4 Credits (3+2P)**

Lecture, demonstration, and laboratory treatment of the general properties of waves, the production, transmission, and reception of sound waves, including musical and vocal sounds, and characteristics of the human ear and several kinds of sources.

**PHYS 150. Elementary Computational Physics**

**3 Credits (2+2P)**

Introduction to computational techniques for the solution of physics-related problems. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 121G or MATH 190G or MATH 191G.

**PHYS 203. Supplemental Instruction to PHYS 213****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 213. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 213.

**PHYS 204. Supplemental Instruction to PHYS 214****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 214. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 214.

**PHYS 205. Supplemental Instruction to PHYS 215G****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 215G. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 215G.

**PHYS 206. Supplemental Instruction to PHYS 216G****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 216G. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 216G.

**PHYS 210. Introductory Physics for the Health Sciences****3 Credits**

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

**Prerequisite(s):** MATH 120 or Equivalent.

**PHYS 211G. General Physics I****3 Credits**

Non-calculus treatment of mechanics, waves, sound, and heat. Knowledge of simple algebra and trigonometry is required.

**PHYS 211GL. General Physics I Laboratory****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 211G.

**Prerequisite(s)/Corequisite(s):** PHYS 211G.

**PHYS 212G. General Physics II****3 Credits**

Non-calculus treatment of electricity, magnetism, and light. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 211G or PHYS 221G.

**PHYS 212GL. General Physics II Laboratory****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 212G.

**Prerequisite(s)/Corequisite(s):** PHYS 212G.

**PHYS 213. Mechanics****3 Credits**

Newtonian mechanics. Pre/

**Corequisite(s):** MATH 191G.

**PHYS 213 L. Experimental Mechanics****1 Credit**

Laboratory experiments associated with the material presented in PHYS 213. Science majors. Pre/

**Corequisite(s):** PHYS 213.

**PHYS 214. Electricity and Magnetism****3 Credits**

Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 192G. Prerequisite(s): a C- or better in PHYS 213 or PHYS 215G, and MATH 191G.

**PHYS 214 L. Electricity and Magnetism Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 214.

**Prerequisite(s)/Corequisite(s):** PHYS 214. Prerequisite(s): a C- or better in PHYS 213L or PHYS 215GL.

**PHYS 215G. Engineering Physics I****3 Credits**

Calculus-level treatment of kinematics, work and energy, particle dynamics, conservation principles, simple harmonic motion. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 191G.

**PHYS 215GL. Engineering Physics I Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 215G. Students wishing to use the PHYS 215G-216G sequence to satisfy the basic natural science general education requirement must register for either PHYS 215GL or PHYS 216GL. Pre/

**Corequisite(s):** PHYS 215G.

**PHYS 216G. Engineering Physics II****3 Credits**

A calculus-level treatment of topics in electricity, magnetism, and optics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 213 or PHYS 215G and MATH 192G.

**PHYS 216GL. Engineering Physics II Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 216G.

**Prerequisite(s)/Corequisite(s):** PHYS 216G. Prerequisite(s): A C- or better in PHYS 213L or PHYS 215GL.

**PHYS 217. Heat, Light, and Sound****3 Credits**

Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 213 or PHYS 215G, and MATH 191G.

**PHYS 217 L. Experimental Heat, Light and Sound****1 Credit**

Laboratory experiments associated with the material presented in PHYS 217. Science majors.

**Prerequisite(s)/Corequisite(s):** PHYS 217. Prerequisite(s): a C- or better in PHYS 213L or PHYS 215GL.

**PHYS 218. Supplemental Instruction to PHYS 217****0.5-1 Credits (.5-1)**

This optional workshop supplements PHYS 217 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 217 to problem solving and quantitative analysis. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 217.

**PHYS 221G. General Physics for Life Sciences I****3 Credits**

This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

**Prerequisites:** a C or better in MATH 120 or higher.

**PHYS 221GL. Laboratory to General Physics for Life Science I****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 221G.

**Prerequisite(s)/Corequisite(s):** PHYS 221G. Restricted to Las Cruces campus only.

**PHYS 222G. General Physics for Life Sciences II****3 Credits**

This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 211G or PHYS 221G, and MATH 121G.

**PHYS 222GL. Laboratory to General Physics for Life Sciences II****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 222G.

**Prerequisite(s)/Corequisite(s):** PHYS 222G. Restricted to Las Cruces campus only.

**PHYS 223. Supplemental Instruction to PHYS 221****1 Credit**

This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.

**Corequisite(s):** PHYS 221G.

**PHYS 224. Supplemental Instruction to PHYS 222****1 Credit**

This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving.

**Corequisite(s):** PHYS 222G.

**PHYS 280. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 290. Special Topics****1-3 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PHYS 303V. Energy and Society in the New Millennium****3 Credits**

Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

**PHYS 304. Forensic Physics****4 Credits (3+3P)**

Theories, laboratory, and field techniques in the area of forensic physics.

**PHYS 305V. The Search for Water in the Solar System****3 Credits**

Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.

**PHYS 315. Modern Physics****3 Credits**

An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 291G and PHYS 214 or PHYS 216G.

**PHYS 315 L. Experimental Modern Physics****3 Credits (1+6P)**

Elementary laboratory in modern physics which supports the subject matter in PHYS 315. Required for physics majors. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 315. Prerequisite(s): a C- or better in PHYS 214L or 216GL.

**PHYS 316. Supplemental Instructions to PHYS 315****1 Credit**

This optional workshop supplements PHYS 315 "Modern Physics".

Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.

**Corequisite(s):** PHYS 315.

**PHYS 350. Special Topics****1-3 Credits**

Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

**PHYS 380. Individual Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 395. Intermediate Mathematical Methods of Physics****3 Credits**

Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): a C- or better in MATH 291G.

**PHYS 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 420. Capstone Project I****3 Credits**

Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

**PHYS 421. Capstone Project II****3 Credits**

Continuation of PHYS 420.

**PHYS 450. Selected Topics****1-3 Credits**

Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

**PHYS 451. Intermediate Mechanics I****3 Credits**

Vector calculus, Lagrangian and Hamiltonian formulations of Newtonian mechanics. Topics include central force motion, dynamics of rockets and space vehicles, rigid body motion, noninertial reference frames, oscillating systems, relativistic mechanics, classical scattering, and fluid mechanics. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): a C- or better in PHYS 213 or PHYS 215G, and MATH 291G.

**PHYS 454. Intermediate Modern Physics I****3 Credits**

Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392 and PHYS 395. Prerequisite(s): a C- or better in PHYS 315.

**PHYS 455. Intermediate Modern Physics II****3 Credits**

Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 454, MATH 392, and PHYS 395.

**PHYS 461. Intermediate Electricity and Magnetism I****3 Credits**

The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392 and PHYS 395. Prerequisite(s): a C- or better in PHYS 214 or PHYS 216G or equivalent and a C- or better in MATH 291G.

**PHYS 462. Intermediate Electricity and Magnetism II****3 Credits**

Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 461, MATH 392, and PHYS 395.

**PHYS 467. Nanoscience and Nanotechnology****3 Credits**

See CHME 467. Crosslisted with: CHME 467. ).

**Prerequisite(s):** CHEM 112 and (PHYS 211 or PHYS 215) and (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard.

**PHYS 468. Intermediate X-ray Diffraction****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: CHME 488.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 471. Modern Experimental Optics****3 Credits (1+6P)**

Advanced laboratory experiments in optics related to the material presented in PHYS 473.

**Prerequisite(s):** PHYS 315 and PHYS 315L.

**PHYS 473. Introduction to Optics****4 Credits**

The nature of light, Geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. May be repeated up to 4 credits. Crosslisted with: E E 473.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**PHYS 475. Advanced Physics Laboratory****1-3 Credits (1+6P)**

Advanced undergraduate laboratory involving experiments in atomic, molecular, nuclear, and condensed-matter physics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 476. Computational Physics****3 Credits**

An introduction to finite difference methods, Fourier expansions, Fourier integrals, solution of differential equations, Monte Carlo calculations, and application to advanced physics problems. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 150 or equivalent and MATH 392.

**PHYS 478. Fundamentals of Photonics****4 Credits (3+3P)**

See E E 478. Crosslisted with: E E 478.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**PHYS 479. Lasers and Applications****4 Credits (3+3P)**

See E E 479 Crosslisted with: E E 479.

**Prerequisite(s):** C- or better in E E 315 or PHYS 461.

**PHYS 480. Thermodynamics****3 Credits**

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 217, PHYS 315, and MATH 291G.

**PHYS 485. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 488. Introduction to Condensed Matter Physics****3 Credits**

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315.

**PHYS 489. Introduction to Modern Materials****3 Credits**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315.

**PHYS 491. High Energy Physics I****3 Credits**

Particle detectors, accelerators, and experimental techniques. Fundamental particles and interactions. Symmetries in particle physics. Quark model of hadrons. Electroweak theory. Strong interactions and QCD. Nuclear interactions at high energies. Grand unification. Super symmetry. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 455.

**PHYS 493. Experimental Nuclear Physics****3 Credits (1+6P)**

Selected experimental investigations in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 495. Mathematical Methods of Physics I****3 Credits**

Applications of mathematics to experimental and theoretical physics. Topics selected from: complex variables; special functions; numerical analysis; Fourier series and transforms, Laplace transforms. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 392 and PHYS 395.

**PHYS 500. Special Topics Seminar****1-2 Credits**

Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

**PHYS 511. Mathematical Methods of Physics I****3 Credits**

Same as PHYS 495. Additional work required at a more advanced level.

**PHYS 520. Selected Topics****1-3 Credits**

Formal treatment of graduate-level topics not covered in regular courses. May be repeated for a maximum of 9 credits.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.

**PHYS 521. Individual Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.

**PHYS 528. Fundamentals of Photonics****4 Credits (3+3P)**

Same as E E 528. Crosslisted with: E E528.

**PHYS 551. Classical Mechanics****3 Credits**

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

**PHYS 554. Quantum Mechanics I****3 Credits**

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

**PHYS 555. Quantum Mechanics II****3 Credits**

Continuation of topics in PHYS 554.

**Prerequisites:** PHYS 554 or consent of instructor.

**PHYS 561. Electromagnetic Theory I****3 Credits**

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

**PHYS 562. Electromagnetic Theory II****3 Credits**

Continuation of topics in PHYS 561.

**Prerequisites:** PHYS 561 or consent of instructor.

**PHYS 567. Nanoscience and Nanotechnology****3 Credits**

See CHME 567. Crosslisted with: CHME 567.

**PHYS 568. Elements of X-ray Diffraction****3 Credits**

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

**PHYS 571. Advanced Experimental Optics****3 Credits**

Taught with PHYS 471 with additional work required at the graduate level. Consent of Instructor required.

**Prerequisite(s):** PHYS 473 or PHYS 562.

**PHYS 575. Advanced Physics Laboratory****1-3 Credits (1+6P)**

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

**PHYS 576. Advanced Computational Physics I****3 Credits**

Advanced treatment of topics listed under PHYS 476, plus additional required work. Applications of numerical methods to complex physical systems. Recommended knowledge of Fortran or C, and MATH 377 or MATH 392. Same as PHYS 476, but additional work required.

**PHYS 577. Fourier Methods in Electro-Optics****3 Credits**

Same as E E 577 Crosslisted with: E E 577

**PHYS 584. Statistical Mechanics****3 Credits**

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

**PHYS 588. Condensed Matter Physics****3 Credits**

Same as PHYS 488, but additional work required.

**Prerequisite(s):** PHYS 554 or consent of instructor.

**PHYS 589. Modern Materials****3 Credits**

Same as PHYS 489 with differentiated assignments for graduate students.

**Prerequisite:** PHYS 554 or consent of instructor.

**PHYS 591. Advanced High-Energy Physics I****3 Credits**

Taught with PHYS 491 with additional work required at the graduate level.

**Prerequisite(s):** PHYS 555 or consent of instructor.

**PHYS 592. Advanced High-Energy Physics II****3 Credits**

Continuation of topics in PHYS 591

**Prerequisite(s):** PHYS 591.

**PHYS 593. Advanced Experimental Nuclear Physics****3 Credits (1+6P)**

Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

**PHYS 597. Space Plasma Physics****3 Credits**

Same as PHYS 497 but with added requirements.

**PHYS 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**PHYS 600. Research****1-15 Credits**

Doctoral research. May be repeated.

**PHYS 620. Advanced Topics in Physics****1-3 Credits**

Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**PHYS 650. General Relativity I****3 Credits**

Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.

**Prerequisite(s):** PHYS 511 or PHYS 561 or consent of instructor.

**PHYS 680. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** graduate standing or consent of instructor.

**PHYS 688. Advanced Condensed Matter Physics****3 Credits**

Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

**PHYS 689. Advanced Modern Materials****3 Credits**

Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces.

**Prerequisites:** PHYS 555, PHYS 588, or consent of instructor.

**PHYS 691. Quantum Field Theory I****3 Credits**

Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.

**Prerequisites:** PHYS 555 and PHYS 562, or consent of instructor.

**PHYS 692. Quantum Field Theory II****3 Credits**

QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.

**Prerequisite:** PHYS 691 or consent of instructor.

**PHYS 700. Doctoral Dissertation****1-15 Credits (1-15)**

Dissertation.

**Phone:** (575) 646-3831

**Website:** <http://engineeringphysics.nmsu.edu/>

## Engineering Physics - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (BS) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The BS in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The BS in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment.

The goals of the program are:

1. to give students a strong education in the fundamentals of physics, engineering, applied mathematics and computation;
2. to develop skill in real-world problem solving starting from fundamental physical principles;
3. to improve communication skills; and
4. to develop ability to work in a team.

The student must choose one of four concentrations in

- Aerospace Engineering,
- Chemical Engineering,
- Electrical Engineering, or
- Mechanical Engineering.

The requirements are listed below. Students must earn a C- or better in all required courses.

## Concentration: Aerospace

### General Education

#### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
	Written Communications Elective <sup>1</sup>	3
	Oral Communications Elective <sup>1</sup>	3

##### Area II: Mathematics

MATH 191G	Calculus and Analytic Geometry I	4
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##### Area III: Natural Science

Select one of the following:		4
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PHYS 213 & 213 L	Mechanics and Experimental Mechanics
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PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory
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Select one of the following:		4
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PHYS 214 & 214 L	Electricity and Magnetism and Electricity and Magnetism Laboratory
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PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory
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##### Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts

Select 15 total credits from Areas IV and V, with at least six credits from each area: <sup>1</sup> 15

##### Area IV: Social and Behavioral Sciences:

Select 6-9 credits from Economics, Political Science, Psychology, Sociology, and Anthropology electives <sup>1</sup>

##### Area V: Humanities and Fine Arts:

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, or Foreign Language electives <sup>1</sup>

### Institution Specific General Education

Viewing a Wider World Electives <sup>2</sup> 3-6

### Program Specific Requirements

#### Mathematics

MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3

#### Natural Science

CHEM 111G or CHEM 115	General Chemistry I or Principles of Chemistry I	4
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#### Physics

PHYS 217 & 217 L	Heat, Light, and Sound and Experimental Heat, Light and Sound	4
PHYS 315	Modern Physics	3
PHYS 315 L	Experimental Modern Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3

#### Engineering

A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3
A E 424	Aerospace Systems Engineering	3
A E 428	Aerospace Capstone Design	3
A E 439	Aerodynamics II	3
A E 447	Aerofluids Laboratory	3
C E 301	Mechanics of Materials	3
ENGR 100	Introduction to Engineering	3
M E 236	Engineering Mechanics I	3
M E 237	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
M E 345	Experimental Methods I	3

Total Credits 127-130

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> See the required courses (p. 46) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

## Concentration: Chemical

### General Education

#### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
	Written Communications Elective <sup>1</sup>	3
	Oral Communications Elective <sup>1</sup>	3

**Area II: Mathematics**

MATH 191G	Calculus and Analytic Geometry I	4
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**Area III: Natural Science**

Select one of the following: 4

PHYS 213 & 213 L	Mechanics and Experimental Mechanics	
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PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory	
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Select one of the following: 4

PHYS 214 & 214 L	Electricity and Magnetism and Electricity and Magnetism Laboratory	
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PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	
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**Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts**

Select 15 total credits from Areas IV and V, with at least six credits from each area: <sup>1</sup> 15

**Area IV: Social and Behavioral Sciences:**  
Select 6-9 credits from Economics, Political Science, Psychology, Sociology, and Anthropology electives <sup>1</sup>

**Area V: Humanities and Fine Arts:**  
Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, or Foreign Language electives <sup>1</sup>

**Institution Specific General Education**

Viewing a Wider World Electives <sup>2</sup> 3-6

**Program Specific Requirements**

**Mathematics**

MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3

**Natural Science**

CHEM 115	Principles of Chemistry I	4
CHEM 116	Principles of Chemistry II	4
CHEM 313	Organic Chemistry I	3

**Electives**

Technical Elective <sup>3</sup> 3

**Physics**

PHYS 217 & 217 L	Heat, Light, and Sound and Experimental Heat, Light and Sound	4
PHYS 315	Modern Physics	3
PHYS 315 L	Experimental Modern Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 475	Advanced Physics Laboratory (must complete 3 credits)	3

**Engineering**

CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3
CHME 352 L	Simulation of Unit Operations	1
CHME 361	Engineering Materials	3
CHME 441	Chemical Kinetics and Reactor Engineering	3
ENGR 100	Introduction to Engineering	3

Total Credits 126-129

- <sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.
- <sup>2</sup> See the required courses (p. 46) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).
- <sup>3</sup> A list of approved technical electives is available from Engineering Physics Advisors.

## Concentration: Electrical

**General Education**

**State of New Mexico Common Core**

**Area I: Communications**

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective <sup>1</sup>		3
Oral Communications Elective <sup>1</sup>		3

**Area II: Mathematics**

MATH 191G	Calculus and Analytic Geometry I	4
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**Area III: Natural Science**

Select one of the following: 4

PHYS 213 & 213 L	Mechanics and Experimental Mechanics	
PHYS 215G & 215GL	Engineering Physics I and Engineering Physics I Laboratory	

Select one of the following: 4

PHYS 214 & 214 L	Electricity and Magnetism and Electricity and Magnetism Laboratory	
PHYS 216G & 216GL	Engineering Physics II and Engineering Physics II Laboratory	

**Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts**

Select 15 total credits from Areas IV and V, with at least six credits from each area: <sup>1</sup> 15

**Area IV: Social and Behavioral Sciences:**  
Select 6-9 credits from Economics, Political Science, Psychology, Sociology, and Anthropology electives <sup>1</sup>

**Area V: Humanities and Fine Arts:**

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, or Foreign Language electives <sup>1</sup>

#### Institution Specific General Education

Viewing a Wider World Electives <sup>2</sup> 3-6

#### Program Specific Requirements

##### Mathematics

MATH 192G Calculus and Analytic Geometry II 4

MATH 291G Calculus and Analytic Geometry III 3

MATH 392 Introduction to Ordinary Differential Equations 3

##### Natural Science

CHEM 111G General Chemistry I 4

or CHEM 115 Principles of Chemistry I

##### Electives

Technical Elective <sup>3</sup> 3

Select one of the following: 3-4

PHYS 462 Intermediate Electricity and Magnetism II

E E 340 Fields and Waves

##### Physics

PHYS 217 Heat, Light, and Sound 4  
& 217 L and Experimental Heat, Light and Sound

PHYS 315 Modern Physics 3

PHYS 315 L Experimental Modern Physics 3

PHYS 395 Intermediate Mathematical Methods of Physics 3

PHYS 451 Intermediate Mechanics I 3

PHYS 454 Intermediate Modern Physics I 3

PHYS 455 Intermediate Modern Physics II 3

PHYS 461 Intermediate Electricity and Magnetism I 3

PHYS 475 Advanced Physics Laboratory (must complete 3 credits) 3

PHYS 480 Thermodynamics 3

##### Engineering

E E 100 Introduction to Electrical and Computer Engineering 4

E E 112 Embedded Systems 4

E E 200 Linear Algebra, Probability and Statistics Applications 4

E E 212 Introduction to Computer Organization 4

E E 230 AC Circuit Analysis and Introduction to Power Systems 4

E E 317 Semiconductor Devices and Electronics I 4

E E 320 Signals and Systems I 3

E E 418 Capstone Design I 3

E E 419 Capstone Design II 3

ENGR 100 Introduction to Engineering 3

Total Credits 127-131

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> See the required courses (p. 46) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

<sup>3</sup> A list of approved technical electives is available from Engineering Physics Advisors.

## Concentration: Mechanical

#### General Education

##### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G Rhetoric and Composition 4

Written Communications Elective <sup>1</sup> 3

Oral Communications Elective <sup>1</sup> 3

##### Area II: Mathematics

MATH 191G Calculus and Analytic Geometry I 4

##### Area III: Natural Science

Select one of the following: 4

PHYS 213 Mechanics  
& 213 L and Experimental Mechanics

PHYS 215G Engineering Physics I  
& 215GL and Engineering Physics I Laboratory

Select one of the following: 4

PHYS 214 Electricity and Magnetism  
& 214 L and Electricity and Magnetism Laboratory

PHYS 216G Engineering Physics II  
& 216GL and Engineering Physics II Laboratory

##### Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts

Select 15 total credits from Areas IV and V, with at least six credits from each area: <sup>1</sup> 15

##### Area IV: Social and Behavioral Sciences:

Select 6-9 credits from Economics, Political Science, Psychology, Sociology, and Anthropology electives <sup>1</sup>

##### Area V: Humanities and Fine Arts:

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, or Foreign Language electives <sup>1</sup>

#### Institution Specific General Education

Viewing a Wider World Electives <sup>2</sup> 3-6

#### Program Specific Requirements

##### Mathematics

MATH 192G Calculus and Analytic Geometry II 4

MATH 291G Calculus and Analytic Geometry III 3

MATH 392 Introduction to Ordinary Differential Equations 3

##### Natural Science

CHEM 111G General Chemistry I 4

or CHEM 115 Principles of Chemistry I

##### Electives

PHYS 451 Intermediate Mechanics I 3

or M E 333 Intermediate Dynamics

Technical Elective 3

##### Physics

PHYS 217 Heat, Light, and Sound 4  
& 217 L and Experimental Heat, Light and Sound

PHYS 315 Modern Physics 3

PHYS 315 L Experimental Modern Physics 3

PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
<i>Engineering</i>		
C E 301	Mechanics of Materials	3
ENGR 100	Introduction to Engineering	3
M E 159	Graphical Communication and Design	2
M E 236	Engineering Mechanics I	3
M E 237	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
M E 326	Mechanical Design	3
M E 338	Fluid Mechanics	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 425	Design of Machine Elements	3
M E 426	Design Project Laboratory I	3
M E 427	Design Project Laboratory II	3
Total Credits		126-129

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> See the required courses (p. 46) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

## Engineering Technology and Surveying Engineering

### Undergraduate Program Information

Educational opportunities offered by the Department of Engineering Technology and Survey Engineering (<https://et.nmsu.edu>) (ETSE) in the College of Engineering (<https://enr.nmsu.edu>) place an emphasis on the *theory and practical hands-on application of engineering principles and methods*, under the motto of “*linking theory and application*”. Many ETSE graduates go on to earn advanced degrees but most typically begin their careers upon graduation and can select from public or private employment opportunities in a wide variety of fields.

Four ABET [www.abet.org](http://www.abet.org) (<http://www.abet.org>) accredited four-year Bachelor of Science (BS) degrees in Engineering Technology are offered by the department with majors in:

- **Electronics and Computer Engineering Technology** (p. 615) (ECET) - **Visit the ECET** (<https://et.nmsu.edu/academics/electronics-and-computer-engineering-technology-ecet>) **web page**,
- **Information Engineering Technology** (p. 617) (IET) - **Visit the (IET)** (<https://et.nmsu.edu/academics/information-engineering-technology-iet>) **web site**
- **Mechanical Engineering Technology** (p. 618) (MET) - **Visit the (MET)** (<https://et.nmsu.edu/academics/mechanical-engineering-technology-met>) **web site or; Want to know more?** (<https://et.nmsu.edu/files/2016/10/MET-Intro.mp4>)

- **Civil Engineering Technology** (p. 614) (CET) - **Visit the (CET)** (<https://et.nmsu.edu/academics/civil-engineering-technology-cet>) **web site or;** (<https://et.nmsu.edu/academics/civil-engineering-technology-cet>) **Want to learn more?** (<https://et.nmsu.edu/files/2016/10/CET-Intro.pdf>)

An ABET accredited four-year Bachelor of Science (BS) degree in Surveying Engineering is offered by the department:

- **Geomatics or Surveying Engineering** (p. 619) (SE) - **Visit the (SE)** (<https://et.nmsu.edu/academics/surveying-engineering>) **web site** - offered online beginning Fall 2018

A Bachelor's degree is also offered via a two-year degree completion program for students having an Associate's degree:

- **Information and Communication Technology** (p. 620) (ICT) (<https://et.nmsu.edu/academics/information-and-communication-technology-ict>) Bachelor degree completely **on-line** via a distance education format. See the **ICT Course Listing** (p. 904) for a complete list of available courses

NMSU is accredited under the Higher Learning Commission (<http://www.hlcommission.org>).

Opportunities are available for students to **Concentrate** in a particular area within their major or earn a Minor (<https://et.nmsu.edu/academics/degree-programs-overview>) to complement their degree.

The Mission of the ETSE Department is to provide students with a quality engineering technology or surveying/geomatics education that links theory and application, provides a rigorous fundamental education, and gives students enhanced career opportunities.

The department's goals supporting this mission are:

- to provide educational and social environments that promote and facilitate student learning
- to have a highly respected and visible department
- to foster the development of the department and
- to graduate students who are competent and sought after by industry

View our Educational Objectives of our Engineering Technology Programs (<https://et.nmsu.edu/accreditation-and-assessment/outcomes>) page to see detailed information of what our students will gain upon graduating from an Engineering Technology and Surveying Engineering degree program.

### Requirements Related to Transfer of Academic Credit

Students transferring to NMSU may receive transfer credit (<https://enr.nmsu.edu/course-transfer-credit>) depending on completed courses and source institutions. Articulation agreements (<https://et.nmsu.edu/academics/transfer-student-information>) exist for many New Mexico Community Colleges and represent a framework for transfer of academic credit. General degree requirements of the College of Engineering and NMSU also apply to ETSE department majors. The Engineering Transfer Policy (<https://enr.nmsu.edu/engineering-transfer-policy>) applies to any course in an ABET accredited major that is not to be completed on the NMSU main campus by a student already having official degree seeking status within the department.

- The department head must approve the course **prior** to enrollment and the course must be offered by an ABET accredited program (exceptions may be made when existing articulation agreements with

NMSU are relevant). In all cases, a corresponding course syllabus and any other supporting documentation are to be submitted, together with the student's completed online request, before the course will be considered for transfer credit approval.

- To qualify for approval, the technical content and rigor must also be substantially the same as the equivalent NMSU course and the student must have satisfied all relevant university prerequisite requirements. If program co- and prerequisite requirements are not met, transfer credit will not be approved.
- No credit for on-line courses of another institution may be substituted to meet departmental core curriculum requirements.

To formally request approval to transfer a core course from another institution, you must complete the Engineering Transfer Course Request Form. (<https://enr.nmsu.edu/15466-2>)

## Academic Performance Requirements

In addition to University (p. 53) and College of Engineering specific requirements (p. 556), as outlined in the NMSU General Information and College of Engineering catalog sections, departmental majors are expected to maintain a status of academic good standing and to complete degree requirements in a timely manner.

Courses in engineering, technology, math and science (and their respective pre- and corequisites) must be completed with a minimum grade of C- to be counted toward the fulfillment of degree requirements. This also includes all courses in the NM General Education Common Core Areas I, II, and III. If a grade lower than C- is earned in one of the above noted courses, the student will be required to retake that course during the first subsequent semester in which it is offered.

An ETSE student may attempt to complete core curriculum courses no more than three times for outcomes involving D or F letter grades. After this specified number of attempts without a passing grade of C- or better, the student will be prohibited from enrolling in any course offered within the college of engineering for a minimum period of one year; after which they may appeal to the college and department for re-admission into the program. Any credit earned outside the college during a period of academic suspension will not qualify for subsequent transfer credit toward core course degree requirements. Refer to the section of the catalog for **university academic probation policies** (p. 53).

## Requirements for Graduation

The completion of ETSE undergraduate degrees are contingent upon fulfillment of

1. **University requirements** (p. 71) as outlined in relevant sections of this catalog,
2. policy expectations as outlined under **College General Requirements** (p. 556), and
3. departmental requirements, as outlined above and within the individual program descriptions of this catalog.

**Go to Top Of Page** (p. 605)

## Degrees for the Department

Information and Communication Technology (p. 620) - Bachelor of Information and Communication Technology

Engineering Technology - Civil (p. 614) - Bachelor of Science (BS) in Engineering Technology

Engineering Technology - Electronics and Computer - (p. 615) Bachelor of Science (BS) in Engineering Technology

Engineering Technology - Information (p. 617) - Bachelor of Science (BS) in Engineering Technology

Engineering Technology - Mechanical (p. 618) - Bachelor of Science (BS) in Engineering Technology

Geomatics (p. 619) - Bachelor of Science (BS)

## Minors for the Department

Digital Electronic Applications (p. 621) - Undergraduate Minor

Digital Forensics (p. 621) - Undergraduate Minor

Manufacturing (p. 622) - Undergraduate Minor

Renewable Energy Technologies (p. 622) - Undergraduate Minor

Information Security Technology (p. 622) - Undergraduate Minor

Geomatics (Surveying Engineering) (p. 621) - Undergraduate Minor

**Professor Thomas Jenkins, Department Head**

**Assistant Professor Barbara Gamillo**

([https://myaccount.nmsu.edu/phonebook?](https://myaccount.nmsu.edu/phonebook?txtFirstName=barbara&txtLastName=Gamillo&txtEmail=&chkEmployees=Employees)

[txtFirstName=barbara&txtLastName=Gamillo&txtEmail=&chkEmployees=Employees](https://myaccount.nmsu.edu/phonebook?txtFirstName=barbara&txtLastName=Gamillo&txtEmail=&chkEmployees=Employees)

**Associate Department Head**

**Professors** Cooper<sup>1</sup>, Jenkins, Jiang<sup>1</sup>, Stevens<sup>1</sup>; **Associate Professors** Sassenfeld, Nogales, Wurm<sup>2</sup>; **Assistant Professors** S. Ben Ayed, Braker, B. Gamillo, E. Gamillo, Morrell, Tapia; **Emeritus Faculty** Alexander, Burkholder<sup>1,2</sup>, Cameron, Hyde, Reilly<sup>2</sup>, Ricketts, Rico,

**Staff** Administrative Assistant Carol Serna

([https://myaccount.nmsu.edu/phonebook?](https://myaccount.nmsu.edu/phonebook?txtFirstName=carol&txtLastName=serna&txtEmail=&chkEmployees=Employees)

[txtFirstName=carol&txtLastName=serna&txtEmail=&chkEmployees=Employees](https://myaccount.nmsu.edu/phonebook?txtFirstName=carol&txtLastName=serna&txtEmail=&chkEmployees=Employees))

<sup>1</sup> Registered Professional Engineer (NM).

<sup>2</sup> Licensed Professional Surveyor (NM).

## Engineering Technology Courses

**E T 101. Introduction to Engineering Technology**

**1 Credit**

The development of engineering technology, with an introduction to engineering technology, education, and practice. Graded S/U.

**E T 104. Soldering Techniques**

**1 Credit**

Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards.

**E T 106. Drafting Concepts/Computer Drafting Fundamentals I**

**4 Credits (2+4P)**

Basic drafting skills, terminology, and visualization. Introduction to principles and fundamentals of computer-aided drafting. Community Colleges only. Same as DRFT 112.

**Prerequisite:** OECS 125, OECS 207, or consent of instructor.

**E T 109. Computer Drafting Fundamentals**

**3 Credits (3+2P)**

Crosslisted with: DRFT 109, C E 109 and SUR 109

**E T 110. Introduction to 3-D Modeling (Solid Works)****3 Credits (2+3P)**

Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies.

**E T 120. Computation Software****2-3 Credits (2-3)**

The use of spreadsheet software in the field of engineering technology.

**E T 125. Introduction to Renewable Energy****3 Credits**

Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

**E T 153. Introduction to Computer Networks****3 Credits**

Introduction to basic computer network fundamentals including International Open Systems Interconnect (OSI), the seven-layer model, and various networking hardware devices. Community Colleges only.

**E T 154. Construction Methods and Communications****3 Credits**

Blueprint reading, specifications, and introduction to materials used in construction.

**E T 155. Network Operating Systems I****3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to: Community Colleges only.

**Prerequisite(s):** E T 120 or E T 122.

**E T 156. Introduction to Information Security****2 Credits**

This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.

**Prerequisite(s)/Corequisite(s):** E T 120. Restricted to Community Colleges campuses only.

**E T 160. Introduction to Information Engineering Technology****3 Credits**

An information engineering technology approach to the basics of computer systems and data, computer architecture, hardware and software operation, networks, and data communications. May be repeated up to 3 credits.

**E T 182. Digital Logic****3 Credits**

The use of truth tables, Boolean equations, and diagrams to define, simplify, and implement logic-valued functions.

**E T 183. Applied DC Circuits****3 Credits (2+2P)**

Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 121G.

**E T 183 L. Applied DC Circuits Lab****1 Credit**

DC applied circuits lab. May be repeated up to 1 credits.

**Corequisite(s):** E T 183.

**E T 184. Applied AC Circuits****3 Credits (2+2P)**

Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Prerequisite(s): E T 183.

**E T 184 L. Applied AC Circuits Lab****1 Credit**

AC applied circuits lab May be repeated up to 1 credits.

**Corequisite(s):** E T 184.

**E T 190. Applied Circuits****4 Credits (3+2P)**

Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab.

**Prerequisite(s)/Corequisite(s):** MATH 190G.

**E T 191. Applied Circuits Laboratory****1 Credit**

Applied Circuits Lab May be repeated up to 1 credits.

**E T 200. Special Topics****1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**E T 203. Computational Foundations****3 Credits**

Fundamental concepts of various proof techniques. These concepts will be applied to the use of computer algorithms, programming languages and other engineering and technology applications. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 190G and E T 262.

**E T 210. Intermediate 3-D Modeling (Solid Works)****3 Credits (2+2P)**

Intermediate 3-D modeling. Applied modeling of techniques to prepare for SolidWorks certification (CSWA). May be repeated up to 3 credits.

**Prerequisite(s):** E T 110.

**E T 217. Manufacturing Processes****3 Credits**

Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. May be repeated up to 3 credits. Crosslisted with: I E 217.

**Prerequisite(s)/Corequisite(s):** E T 217L. Prerequisite(s): E T 110 and MATH 121G.

**E T 217 L. Manufacturing Processes Lab****1 Credit**

Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 217.

**E T 220. Internship****1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** E T 283.

**E T 230. Introduction to Servo Systems****1 Credit**

Introduction to Servo Systems. Topics include uses of servos in the industry, servo types, loop gains and frequency response, software control systems, damping, feedback, encoders, synchros and resolvers. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 246.

**E T 240. Applied Statics****3 Credits**

Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 235G or MATH191G.

**Prerequisite(s):** PHYS 211G or PHYS 215G.

**E T 241. Applied Dynamics****3 Credits**

The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum. May be repeated up to 3 credits.

**Prerequisite(s):** E T 240, (MATH 235 or MATH 191G).

**E T 245. Computer Hardware Fundamentals****3 Credits (2+2P)**

Computer hardware fundamentals including architecture, interfacing, peripherals, troubleshooting, system upgrades, and maintenance. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**E T 246. Electronic Devices I****4 Credits (3+3P)**

Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers. May be repeated up to 4 credits.

**Prerequisite(s):** E T 190 or E T 184.

**E T 253. Networking Operating Systems II****3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 155.

**E T 254. Concrete Technology****3 Credits (2+2P)**

Fundamentals of aggregates, Portland cement, and asphalt used in design and construction.

**E T 255. Linux System Administration****3 Credits**

Introduction to Linux system administration.

**Prerequisite(s)/Corequisite(s):** E T 160.

**E T 256. Networking Operating Systems III****3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 253.

**E T 262. Software Technology I****3 Credits (2+2P)**

An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 182 or MATH 190G.

**E T 272. Electronic Devices II****4 Credits (3+3P)**

Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** MATH 235G or MATH 191G.

**Prerequisite(s):** E T 246.

**E T 273. Fundamentals of Networking Communications I****4 Credits (2+4P)**

Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling. Community Colleges only. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 153.

**E T 276. Electronic Communications****3 Credits (2+2P)**

Antennas, transmission devices, A-M and F-M transmission and detection, pulse systems, microwave systems.

**Prerequisite(s):** E T 246.

**E T 277. Computer Networking I for IET****3 Credits (2+2P)**

Computer network design and applications for LAN to WAN, protocols, switches, bridges, routers, NT server, TCP/IP networks, network diagnostics, voice over IP, wireless networks, and the OSI layers from physical to transport. May be repeated up to 3 credits.

**Prerequisite(s):** E T 182.

**E T 280. Introduction to Multimedia****3 Credits**

Introduction to video, audio and other digital presentation methods.

**Prerequisite(s):** E T 255.

**E T 282. Digital Electronics****4 Credits (3+3P)**

Applications of digital integrated circuits, multiplexers, counters, arithmetic circuits, and microprocessors. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** (E T 190 or E T 184). **Prerequisite(s):** E T 182.

**E T 283. Hardware PC Maintenance****3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer hardware components.

**Prerequisite(s):** E T 120 or E T 122.

**E T 284. Software PC Maintenance****3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer operating systems.

**Prerequisite(s):** E T 120 or E T 122.

**E T 285. Advanced Information Security****3 Credits**

Examines the field of information security within a real-world context of issues faced by today's IT professionals. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 283. Prerequisite(s): E T 156.

**E T 286. Information Security Certification Preparation****4 Credits (3+1P)**

An overview of general security concepts for information technology systems.

**Prerequisite(s):** E T 285.

**E T 287. PC Disaster and Data Recovery****3 Credits**

This course provides an overview of the various causes of personal computer data failure and methods to mitigate the loss of your personal computer data. The focus is on restoring your personal computer to full PC functionality and recovering lost and damaged files after one of these unforeseen problems. In addition, the course provides a means to lessen the impact of these inevitable events with the preparation of a disaster recovery plan.

**Prerequisite(s):** E T 120 or E T 122.

**E T 290. Networking Wireless Communication****3 Credits (3+1P)**

This course provides an introduction to wireless networking and communications. Some of the topics covered are protocols, transmission methods, and IEEE 802.11 standards. Wireless LAN (WLAN) fundamentals, devices, and security, cellular telephony, broadband, and satellite communications.

**Prerequisite:** E T 273.

**E T 291. PC Forensics and Investigation****3 Credits**

Introduction to computer forensics and investigative fundamentals. Topics include understanding computer forensic and investigation law and requirements, processing crime and incident scenes, and the extraction, preservation, analysis and presentation of computer-related evidence.

**Prerequisite(s):** E T 120 or E T 122.

**E T 300. Special Topics****1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**E T 302. Manufacturing Data Analysis****3 Credits**

Methods for analyzing data collected during manufacturing processes. Emphasis placed on production control utilizing results of statistical methods and design of experiments.

**Prerequisite(s):** MATH 235.

**E T 305. Introduction to Product Design****3 Credits (2+3P)**

The process of designing an innovative product for a real customer. Working through ideas, prototypes, 3-D models, concept validation, and entrepreneurship. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 210, E T 217, and (COMM 265G or COMM 253G or AXED 201G or HON 265G). Restricted to: ET U,ET M,ET C,ET E majors.

**E T 306. Fundamental and Applied Thermodynamics****3 Credits**

First and second laws, properties of substances, thermodynamic cycles including power generation and refrigeration. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 110G and E T 240 and (MATH 235G or MATH 191G) and (( PHYS 212G or PHYS 216G)and (PHYS 212GL or PHYS 216GL)).

**E T 306 L. Thermodynamics Lab****1 Credit**

Applications of thermodynamic theory to lab devices. Practice in testing, instrumentation, and data collection. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 306 and ((E T 184 201440) or (E T 190 201640)).

**E T 308. Fluid Technology****3 Credits**

Application of basic principles of fluid mechanics to practical applied problems. May be repeated up to 3 credits.

**Prerequisite(s):** (MATH 235 or MATH 191G) and E T 240.

**E T 308 L. Fluid Technology Lab****1 Credit**

Measurements in fluid statics, dynamics, and hydraulic systems. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 308. Prerequisite(s): (MATH 235 or MATH 191G), E T 240.

**E T 309V. Manufacturing: History and Technology****3 Credits**

The history of manufacturing, the technology on which it is based, and its impact on society.

**E T 310. Applied Strength of Materials****3 Credits**

Application of principles of strength of materials to practical design and analysis problems. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 236 or MATH 192G. Prerequisite(s): (MATH 235G or MATH 191G) and E T 240.

**E T 310 L. Applied Strength of Materials Lab****1 Credit**

Testing and analyzing the physical properties of materials. cursory review of Excel, PowerPoint, FEA, Instron machine, and testing standards. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 310.

**E T 312. Emergency Response to Hazardous Material Incidents****2 Credits**

Same as E S 312, WERC 312.

**E T 314. Communications Systems I****3 Credits (3+2P)**

Circuits and devices used for transmission, reception, and processing of RF signals.

**Prerequisite(s):** E T 246 & MATH 190G.

**E T 317. Advanced 3-D Modeling and Design****3 Credits**

Advanced 3-D modeling with current engineering design practices. Students will use SolidWorks add-ins such as CAMWorks, Product Data Management (PDM), and Model-Based Definition in conjunction with Geometric Dimensioning and Tolerancing (GD&T) practices. Students will have the opportunity to take the Certification SolidWorks Professional Exam (CSWP). May be repeated up to 3 credits. Consent of Instructor required. Restricted to: exclude ET U,ET M,ET C,ET E majors.

**Prerequisite(s):** E T 210.

**E T 324. Signal Processing and Filtering****4 Credits (3+3P)**

Application of digital and analog signal conversion models. Discrete time signals and systems. Time and frequency domain concepts. Presentation of Fourier and Z transforms. Application of analog and digital signal filtering with and without feedback. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** (MATH 236 or MATH 191G) and ((PHYS 212G or PHYS 216G) and (PHYS 212GL or PHYS 216GL)).

**Prerequisite(s):** E T 272.

**E T 328. Kinematics of Machines****3 Credits (2+3P)**

Kinematic analysis of machine elements using linkages, cams, and gears. Applied design of mechanical systems using SolidWorks simulation and Excel modeling. May be repeated up to 3 credits.

**Prerequisite(s):** E T 210 and E T 241.

**E T 332. Applied Design of Structures I****4 Credits (3+3P)**

An introduction to structural analysis and design. Use of various building codes for development of allowable and factored loads on structures. Allowable stress and strength design concepts for structural components using concrete and steel. Required use of computer software such as spreadsheets, databases, and self-developed programs and design aids. May be repeated up to 4 credits.

**Prerequisite(s):** E T 310 and (MATH 236 or MATH 192G).

**E T 339. Introduction to Digital Forensics and Incident Response****3 Credits (2+3P)**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting. May be repeated up to 3 credits.

**Prerequisite(s):** E T 255.

**E T 344. Microcomputer Systems****3 Credits (2+3P)**

Microcomputer and/or microcontroller systems applications and architectures with a software emphasis using programming languages.

**Prerequisite(s)/Corequisite(s):** E T 362. **Prerequisite(s):** E T 182 and MATH 190.

**E T 354. Soil and Foundation Technology****4 Credits (3+3P)**

Fundamentals of investigation of soil properties and their importance in design, construction, and testing as related to buildings, roads, dams, and other structures. Design of foundations considering slope stability, bearing capacity and settlement. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** E T 310. **Prerequisite(s):** E T 254.

Restricted to: ET U,ET E,ET M,C E,ET C majors.

**E T 355. Site/Land Development and Layout****3 Credits**

Techniques, methods, and takeoffs for infrastructure layout, site plan design, grading, earthwork, utilities, road construction. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** DRFT 143 or DRFT 153.

**E T 360V. Technology in Business and Society****3 Credits (2+2P)**

Examination of how technology affects business and society with specific attention to understanding the role of technical personnel and their interaction with nontechnical personnel.

**E T 362. Software Technology II****3 Credits**

A continuation of topics from E T 262 that are directed toward more advanced software development. Topics include problem analysis, object oriented, structured logic, and development concepts. May be repeated up to 3 credits.

**Prerequisite(s):** E T 262 and MATH 190G.

**E T 365. Building Utilities****3 Credits (2+3P)**

Basic design and code applications in plumbing and electrical systems for buildings.

**Prerequisites:** junior standing in E T.

**E T 377. Computer Networking I****3 Credits (2+2P)**

Computer network design and applications for LAN to WAN, protocols, switches, bridges, routers, TCP/IP networks, network diagnostics, voice over IP, wireless networks, and the OSI layers from physical to transport. May be repeated up to 3 credits.

**Prerequisite(s):** E T 182 and MATH 190G.

**E T 381. Renewable Energy Technologies****3 Credits**

Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 382. Solar Energy Technologies****3 Credits (2+3P)**

Solar energy technologies, including topics in passive, solar thermal, and photovoltaic systems. Theory, practical applications, safety considerations and the economics of solar renewable energy systems compared to conventional systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 384. Wind and Water Energy Technologies****3 Credits**

Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 386. Sustainable Construction and Green Building Design****3 Credits**

Sustainable Building materials, methods, and techniques including green architecture and design, codes, standards and specifications. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 396. Heat Transfer and Applications****3 Credits (2+3P)**

Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design. May be repeated up to 3 credits.

**Prerequisite(s):** E T 306 and E T 308 and PHYS 212G.

**E T 398. Digital Systems****3 Credits (2+3P)**

Advanced analysis and design of digital systems using state machine logic, programming of logic devices, implementation and testing. Pre/

**Prerequisite(s):** E T 282 and MATH 190G.

**Corequisite(s):** E T 362.

**E T 400. Special Topics****1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**E T 401. Heating and Air-Conditioning Systems****3 Credits**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. Same as M E 401.

**Prerequisite:** E T 306.

**Corequisite:** E T 396.

**E T 402. Instrumentation****3 Credits (2+3P)**

Sensors/transducers, signal conditioning and transmission for measurement and control systems. Student project in an area of instrumentation and/or control is required. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 396 or E T 398.

**E T 410. Senior Seminar****1 Credit**

Transition from academics to business and industry. Graded S/U.

**Prerequisite:** senior standing in E T.

**E T 412. Highway Technology****3 Credits**

Road-vehicle performance, geometric alignment, traffic analysis, highway materials, pavement design, and plan and profile development. May be repeated up to 3 credits.

**Prerequisite(s):** E T 354.

**E T 415. Manufacturing Management and Productivity****3 Credits**

Projects incorporating concurrent engineering, total quality management, design for manufacturability/assembly, and other contemporary topics in manufacturing.

**Prerequisites:** senior standing in E T.

**E T 418. Applied Hydraulics****3 Credits**

Introduction to hydrology, hydraulic equations, hydraulic cross-sections, control structures, and collection and distribution of water, wastewater, and storm runoff using closed conduit and open channel flow.

**Prerequisite(s):** E T 308.

**E T 420. Senior Internship****1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. Taken in the senior year of program.

**Prerequisites:** Senior standing in E T.

**E T 421. Senior Project****3 Credits**

Project in an area of civil engineering technology conducted under the direction of civil engineering technology faculty member. Project must be one that can be completed within a semester and of sufficient complexity for 3 credits. Taken last semester of program.

**E T 426. Analysis and Design of Machine Elements****3 Credits (2+3P)**

Analysis and design of power transmission components, including: gears, sprockets, belts, chains, bearings, and shafts. Experiential design project using SolidWorks and Excel modeling. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 241. Prerequisite(s): E T 210 and E T 310.

**E T 432. Applied Design of Structures II****4 Credits (3+3P)**

Continuation of E T 332. Design of structural systems and study of their responses. Wood and masonry systems included. May be repeated up to 4 credits.

**Prerequisite(s):** E T 332.

**E T 435. Senior Project****3 Credits (2+3P)**

Capstone course. Practical application of student's cumulative knowledge to an assigned design projects. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. May be repeated up to 3 credits. Consent of Instructor required.

**E T 439. Advanced Digital Forensics and Incident Response****3 Credits**

Advanced topics in digital forensics and incident response on Windows, Linux and Mac OS X and mobile devices. Topics include: Memory analysis, registry analysis, timeline analysis, malware analysis, Linux and Mac artifacts, mobile device forensics. May be repeated up to 3 credits.

**Prerequisite(s):** E T 339 and E T 377.

**E T 440. Senior Design****2 Credits (1+2P)**

Team design of a system, mechanism, or model that will be fabricated or simulated during the following semester in E T 441. Pre/

**Prerequisite(s)/Corequisite(s):** E T 444 and E T 402. Restricted to: ET C,ET E,ET M,ET U majors.

**E T 441. Senior Project****2 Credits (1+2P)**

Team fabrication or simulation, testing, and debugging of a system, mechanism or model designed in E T 440.

**Prerequisite(s):** E T 440.

**E T 444. Hardware and Software Senior Design****3 Credits (2+3P)**

The design, development, implementation, documentation and formal demonstration of a microprocessor-based application to solve an engineering problem. Emphasis on microprocessor architectural concepts and software interfacing. A student project is required.  
**Prerequisite(s):** E T 344 and E T 398.

**E T 454. Advanced Construction Technology****3 Credits**

Contractor design and construction methods concerning formwork, special foundations, shoring, excavations, pilings, steel erection, and various material handling components.

**Prerequisite:** E T 354 and E T 355.

**E T 455. Cost Estimating and Scheduling****3 Credits**

Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques.

**Prerequisite:** junior or senior standing in E T.

**E T 456. Applied Power Technologies****4 Credits (3+3P)**

Basic elements of modern power systems, energy sources, substation configuration, load cycles, and three-phase circuits. Students will gain experience in power factor correction, transmission line configurations and impedance, voltage regulation of transformers, and the per-unit system. Study of load flow, fault analysis, and economic operations is included. May be repeated up to 4 credits.

**Prerequisite(s):** (MATH 235 or MATH 191G) and E T 272 and ((PHYS 212G or PHYS 216G) and (PHYS 212GL or PHYS 216GL)).

**E T 458. Database Technology for Engineering****3 Credits**

MySQL and PHP. Data conversion using PHP, mysql and Python. Methods of transferring data from electronic boards and data feeds, into databases. Use of SQL in java programming. Remote programming of computers for running database systems in a mixed OS environment. Generation of web pages directly from Database queries.

**Prerequisite(s):** E T 362 and E T 160.

**E T 460. Web Technologies and Multimedia****3 Credits**

Introduction to web technologies and multimedia. May be repeated up to 3 credits.

**Prerequisite(s):** E T 160.

**E T 463. Advanced Linux and Python Scripting****3 Credits**

Advanced Linux Includes installation and maintenance of Unix/Linux/Windows versions of Python. Use of Python to solve numerous engineering problems including video and audio. Image manipulation. Using PostScript for image and typesetting development. Integration of C programming with Python.

**Prerequisite(s):** E T 255 and E T 362.

**E T 464. Advanced Windows Server Administration****3 Credits**

Learn about configuration and maintenance of Microsoft Windows Server and related services such as DHCP, DNS, Failover Clusters, Active Directory, Group Policy, File Sharing, Microsoft SQL server, Microsoft Exchange Server, IIS, Network Load Balancing, Backups, Remote Administration, PowerShell scripting and more. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 339. **Prerequisite(s):** E T 362.

**E T 472. Intelligent Transportation Systems (ITS)****3 Credits**

Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required.

**E T 477. Computer Networking II****3 Credits**

Advanced concepts in computer network design and applications including managing the campus network, virtual LANs (VLAN), network security, wireless networks, high-speed optical networks, and voice over IP. May be repeated up to 3 credits.

**Prerequisite(s):** E T 277 or E T 377.

**E T 480. Innovation and Product Development****3 Credits**

Experiential product design and development. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** (COMM 265G or COMM 253G or AXED 201G or HON 265G).

**E T 482. Advanced Manufacturing****3 Credits (2+2P)**

Fundamentals of computer aided manufacturing (CAM) and computer numerical control (CNC) machining. Students will learn how to program several variants of CNC machines, using both G/M code programming and computer aided manufacturing software. Emphasis will be on the effective design of parts to be made on CNC machines along with a hands on lab to give students experience on CNC machines. Students will individually design, manufacture, and keep items such as keychains, bottle openers, LED clocks, ergonomic handles, and license plates. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** E T 210 and E T 217.

**E T 490. Selected Topics****1-3 Credits**

Selected topics in engineering technology and related areas.

**Prerequisite:** consent of instructor.

## Surveying Courses

**SUR 101. Introduction to Surveying Engineering****1 Credit**

Review and discussion of career paths open to surveying engineers. Restricted to: Main campus only.

**SUR 201. GPS and Spatial Data Applications****3 Credits**

Overview of spatial data applications based on GPS observations. Emphasis on positioning and navigation using code-phase techniques with handheld receivers. Use of coordinate systems. Students encouraged to have their own GPS handheld unit.

**SUR 222. Plane Surveying****3 Credits (2+3P)**

Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping. May be repeated up to 3 credits. Crosslisted with: DRFT 222.

**Prerequisite(s):** MATH 190G.

**SUR 264. Introduction to LIS****3 Credits (2+3P)**

Introduction to land information systems. Land tenure systems, coordinate systems, computer methods. Pre/

**Corequisite(s):** DRFT 109.

**SUR 285. Precise Digital Mapping****3 Credits**

Perform basic photogrammetric mapping, and create digital terrain models. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** SUR 222 or DRFT 222.

**SUR 292. Public Land Survey System Boundaries****3 Credits (2+3P)**

Detailed study of the U.S. Public Land Survey System Instructions with special emphasis on New Mexico. Sectionalized land subdivision, corner restoration, and field surveys. Field trips required.

**Prerequisite:** SUR 222.

**SUR 312. Legal Principles and Boundary Law I****3 Credits**

Legal principles of property boundary retracement, and rights-of-way. Systems of law and legal research. Principles of the U.S. Public Land Survey System and manual of Instructions May be repeated up to 3 credits.

**Prerequisite(s):** SUR 222 or DRFT 222.

**SUR 322. Laser Scanning Mapping Technologies****3 Credits (2+2P)**

Perform basic terrestrial & airborne LiDAR scan, LiDAR Technologies and Applications will include ranging technologies such as LiDAR, SAR, and Bathymetry, point cloud data management & extraction, scan registration and processing

**Prerequisite(s):** SUR 285.

**SUR 328. Construction Surveying & Automation Technologies****3 Credits (2+3P)**

Construction Surveying Principles: conventional and machine controlled. Layout alignments, grades, various infrastructure, buildings. Understand error identification, common quality control checks and blunder identification. May be repeated up to 3 credits.

**Prerequisite(s):** (SUR 222 or DRFT 222) and (MATH 191G or MATH 235).

**SUR 330. Computer Applications of Surveying****3 Credits (2+3P)**

Advanced application of concepts and tools used in the manipulation of geospatial data in a computer environment. Topics include the use of surveying-specific software applications for problem solving, analysis and generation of spatial data products. Advanced programming skills in a high level language are presented and applied.

**Prerequisite(s):** DRFT 109 AND SUR 222, and ( MATH 191G or MATH 235) and (C S 187 or E T 262 or E E 161).

**SUR 351. Introductory Spatial Data Adjustment I****3 Credits**

Theory of random error in observations/measurements. Use of statistics in spatial data analysis, statistical testing, advanced data structures. Emphasis on computer based problem solving and programming to solve spatial data problems. May be repeated up to 3 credits.

**Prerequisite(s):** (SUR 222 or DRFT 222) and (MATH 191G or MATH 235) and (A ST 311G or STAT 251G) and (C S 151 or C S 152 or E T 262 or E E 161).

**SUR 361. Introduction to Geodesy/Geodetic Control Surveying****3 Credits (2+2P)**

Horizontal and vertical control network design and consideration. May be repeated up to 3 credits.

**Prerequisite(s):** (SUR 222 or DRFT 222) and (MATH 191G or MATH 235).

**SUR 370. Control Surveying****3 Credits (2+3P)**

Design and use of survey control networks. Includes Horizontal, Vertical and 3D networks. Use of standards in control surveying. History of control surveying.

**Prerequisite(s):** SUR 222 and (MATH 191G or MATH 235G).

**SUR 384. Surveying Practicum****1-3 Credits**

Surveying practice under the direction of a licensed, professional land surveyor requiring 45 hours per credit as per a plan worked out between the student and the surveyor and approved by the Surveying Engineering faculty. Work must be certified by the licensed, professional land surveyor. Requires a written report by the student.

**Prerequisites:** SUR 222 and junior standing.

**SUR 401. Ethics and Professionalism in Surveying and Mapping****3 Credits**

Ethics as applied to the surveying profession. Includes case studies and problems.

**Prerequisites:** SUR 312, SUR 328, and senior standing.

**SUR 412. Advanced Topics in Boundary Surveying****3 Credits (2+3P)**

Advanced land boundary topics including water boundaries, mineral claims, Spanish and Mexican land grants, state and national boundaries.

**Prerequisite:** SUR 312.

**SUR 450. Senior Project****1 Credit**

Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education.

**Prerequisite(s):** Senior Standing.

**SUR 451. Advanced Survey Measurements, Analysis, and Adjustments****3 Credits**

Rigorous analysis of the theory of observations as applied to spatial data, application of least squares adjustments, ability to perform statistical analysis to determine accuracy of final product, constrained/free geospatial data integration, error ellipses, and pre-analysis of spatial data acquisition procedures. May be repeated up to 3 credits.

**Prerequisite(s):** SUR 351, (MATH 280 or MATH 480).

**SUR 452. Spatial Data Integration and Analysis****3 Credits (2+2P)**

Methodologies of geospatial data acquisition and integration, knowledge of applications the source data is intended for, accuracies of acquired spatial data, types and analysis of coordinate transformation models. Integrating datasets for routing analysis, location study analysis, land management and long range plans as well as existing needs related to connectivity and safety. May be repeated up to 3 credits.

**Prerequisite(s):** SUR 451.

**SUR 461. GNSS Positioning****3 Credits (2+3P)**

Logistics of GNSS data collection, the GPS signal, codes and biases, error sources, differences between relative and autonomous GNSS positioning, code phase carrier phase, DGPS static and RTK surveys. Geodetic and GPS standards and specifications GNSS data processing, network adjustments, and evaluation of spatial data accuracy practical applications of GNSS May be repeated up to 3 credits.

**Prerequisite(s):** SUR 361.

**SUR 464. Legal Principles and Boundary Law II****3 Credits**

Concepts of real property, land tenure and ethics, and land registration systems; the function and design of multipurpose cadastre and land information systems. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** SUR 312.

**SUR 498. Emerging Technology in Geomatics****3 Credits**

Hydrographic/Bathymetric, Altimetry, Space borne Imaging Systems, Mobile Mapping Systems, Mining and Agriculture Surveying Principles, and advanced ranging data acquisition systems. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor and senior standing.

**Name: Engineering Technology and Surveying Engineering (ETSE)****Physical Address:**

Ed and Harold Foreman Engineering Complex III  
1060 Frenger Mall - Room 130  
Las Cruces, NM 88003-1230  
Map to ETSE (<https://maps.nmsu.edu/?id=419&type=building>)

**Mailing Address:**

Engineering Technology and Surveying Engineering  
New Mexico State University  
P.O. Box 30001, MSC 3566  
Las Cruces, NM 88003-8001

**Phone:** (575) 646-2236

**Website:** <https://et.nmsu.edu/>

# Engineering Technology - Civil - Bachelor of Science in Engineering Technology

CET (<https://et.nmsu.edu/academics/civil-engineering-technology-cet>) students learn to implement current civil engineering practices in design, construction, and project management. They may assist with design and/or supervise the construction of roads, buildings, airports, dams, bridges; and water supply and sewage systems. They take courses in properties

of construction materials, blueprint reading, surveying, applied structural design, highway technology, land development, and hydraulics.

The Civil Engineering Technology program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information>) by the Technology Accreditation Commission (ETAC) of ABET [www.abet.org](http://www.abet.org) (<http://www.abet.org>)

## Requirements (123 credits)

**General Education****State of New Mexico Common Core***Area I: Communications*

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective (ENGL 218G Recommended) <sup>1</sup>		3
Oral Communications Elective (COMM 265G Recommended) <sup>1</sup>		3

*Area II: Mathematics - see below**Area III: Laboratory Science*

CHEM 110G	Principles and Applications of Chemistry	4
PHYS 211G	General Physics I	3
or PHYS 215G	Engineering Physics I	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 215GL	Engineering Physics I Laboratory	

*Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts*

Select 15 total credits from Area IV and V, with at least 6 credits from each area: <sup>1</sup> 15

*Area IV: Social and Behavioral Sciences:*

Select 6-9 credits from Anthropology, Economics, Political Science, Psychology, and Sociology electives <sup>1</sup>

*Area V: Humanities and Fine Arts:*

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, and Religion electives <sup>1</sup>

*Institution Specific General Education*

Viewing a Wider World Electives (must be taken from two different colleges) <sup>1</sup> 6

**Program Specific Requirements***Mathematics*

MATH 235	Calculus for the Technical Student I	3
or MATH 191G	Calculus and Analytic Geometry I	
MATH 236	Calculus for the Technical Student II	3
or MATH 192G	Calculus and Analytic Geometry II	

Select one course (3-4 credits) from the following: 3

PHYS 212G General Physics II  
or PHYS 216G Engineering Physics II

E T 190 Applied Circuits  
E E 201 Electric Circuit Analysis

*Technical*

A ST 311	Statistical Applications	3
ENGR 100	Introduction to Engineering	3
I E 451	Engineering Economy	3
DRFT 109	Computer Drafting Fundamentals	3
DRFT 143	Civil Drafting Fundamentals	3
or DRFT 153	Survey Drafting Applications	

SUR 222 or DRFT 222	Plane Surveying Surveying Fundamentals	3
Geomatics/Surveying Elective - must come from pre-approved list (see advisor)		3
Technical Electives - must come from pre-approved list (see advisor or list in ET office)		9
<i>Engineering Technology</i>		
E T 154	Construction Methods and Communications	3
E T 240 or C E 233	Applied Statics Mechanics-Statics	3
E T 241	Applied Dynamics	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 420 or E T 421	Senior Internship Senior Project	3
E T 432	Applied Design of Structures II	4
<b>Concentrations - students "may" choose to focus on a particular CET concentration (optional) <sup>2</sup></b>		
The following optional concentrations are available:		
Construction Technology		
Geomatics (Surveying Engineering)		
Renewable Energy Technologies		
Transportation Technology		
Water/Wastewater Technology		
Total Credits		123

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses

<sup>2</sup> Concentrations are "optional" educational sequences that students may choose to focus on particular areas related to CET. Concentrations may often be done without additional credits by judicious use of electives and other optional course requirements.

### Concentration: Construction Technology

#### Technical and Surveying Elective Requirements

E T 454	Advanced Construction Technology	3
E T 455	Cost Estimating and Scheduling	3
SUR 328	Construction Surveying & Automation Technologies	3
Select one from the following:		3
MGT 453	Leadership and Motivation	
MGT 454	Work Teams in Organizations	

MGT 461	Seminar in Entrepreneurship	
Total Credits		12

### Concentration: Renewable Energy Technologies

#### Technical and Survey Elective Requirements

E T 381	Renewable Energy Technologies	3
E T 382 or E T 384	Solar Energy Technologies Wind and Water Energy Technologies	3
E T 386	Sustainable Construction and Green Building Design	3
SUR 328	Construction Surveying & Automation Technologies	3
Total Credits		12

### Concentration: Transportation Technology

#### Technical and Survey Elective Requirements

C E 479	Pavement Analysis and Design	3
E T 455	Cost Estimating and Scheduling	3
E T 472	Intelligent Transportation Systems (ITS)	3
SUR 328	Construction Surveying & Automation Technologies	3
Total Credits		12

### Concentration: Water/Wastewater Technology

#### Technical and Survey Elective Requirements

C E 256	Environmental Engineering and Science	3
C E 356	Fundamentals of Environmental Engineering	3
SUR 328	Construction Surveying & Automation Technologies	3
ENVE 456	Environmental Engineering Design	3
Total Credits		12

### Concentration: Geomatics (Surveying Engineering)

#### Technical and Survey Elective Requirements Students

can fulfill the Geomatics Technologies Concentration requirements by choosing four courses from below.

SUR 328	Construction Surveying & Automation Technologies	
SUR 312	Legal Principles and Boundary Law I	
SUR 351	Introductory Spatial Data Adjustment I	
SUR 285	Precise Digital Mapping	
SUR 361	Introduction to Geodesy/Geodetic Control Surveying	
GEOG 381	Cartography and Geographic Information Systems	
Total Credits		12

## Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology

Electronics and Computer Engineering Technology (<https://et.nmsu.edu/academics/electronics-and-computer-engineering-technology-ecet>) (ECET) curriculum include design, building and testing a wide range of electronic and computer systems including digital and analog system, microprocessor systems, machine or micro-controllers, communications devices, applied power systems, digital signal processing, instrumentation, computer networking. Our program includes a diverse exposure to programming languages such as Java and C as well as the electronic design language of HDL.

The ECET program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information>) by the Engineering Technology Accreditation Commission (ETAC) of ABET. [www.abet.org](http://www.abet.org) (<http://www.abet.org>).

## Requirements (121 Total Credits)

### General Education

#### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective (ENGL 218G Recommended) <sup>1</sup>		3
Oral Communications Elective (COMM 265G Recommended) <sup>1</sup>		3

##### Area II: Mathematics - see below

##### Area III: Laboratory Science

PHYS 211G	General Physics I	3
or PHYS 215G	Engineering Physics I	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 215GL	Engineering Physics I Laboratory	
PHYS 212G	General Physics II	3
or PHYS 216G	Engineering Physics II	
PHYS 212GL	General Physics II Laboratory	1
or PHYS 216GL	Engineering Physics II Laboratory	

##### Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts

Select 15 total credits from Area IV and V, with at least 6 credits from each area: <sup>1</sup>		15
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Area IV: Social and Behavioral Sciences:<sup>1</sup>

Area V: Humanities and Fine Arts:<sup>1</sup>

##### Institution Specific General Education

Viewing a Wider World Electives - must be from two different colleges <sup>1</sup>		6
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### Program Specific Requirements

#### Mathematics

MATH 235	Calculus for the Technical Student I	3
or MATH 191G	Calculus and Analytic Geometry I	
MATH 236	Calculus for the Technical Student II	3
or MATH 192G	Calculus and Analytic Geometry II	

#### Technical

A ST 311	Statistical Applications	3
ENGR 100	Introduction to Engineering	3
I E 451	Engineering Economy	3
Technical Electives Upper Division - see advisor or pre-approved list <sup>2</sup>		9

#### Engineering Technology

E T 182	Digital Logic	3
E T 190	Applied Circuits	4
E T 246	Electronic Devices I	4
E T 262	Software Technology I	3
E T 272	Electronic Devices II	4
E T 282	Digital Electronics	4
E T 314	Communications Systems I	3
E T 324	Signal Processing and Filtering	4
E T 344	Microcomputer Systems	3
E T 362	Software Technology II	3
E T 377	Computer Networking I	3
E T 381	Renewable Energy Technologies	3
E T 398	Digital Systems	3
E T 402	Instrumentation	3
E T 410	Senior Seminar	1
E T 435	Senior Project	3
E T 444	Hardware and Software Senior Design	3
E T 456	Applied Power Technologies	4

Total Credits		121
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<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses

<sup>2</sup> Technical electives 300 level and above may come from a pre-approved list (<https://et.nmsu.edu/academics/electronics-and-computer-engineering-technology-ecet>) or see your advisor for other options.

Concentrations are "optional" educational sequences that permit students to focus on particular areas related to their major. Concentrations "may" often be done without additional credits by judicious use of electives and other optional course requirements.

## Concentration: Renewable-Energy Technologies

### Requirements

Select four from the following:		12
E T 365	Building Utilities	
WERC 300	Introduction to Pollution Prevention and Its Application	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 401	Heating and Air-Conditioning Systems	
or M E 401	Heating/Air-Conditioning System	
E T 420	Senior Internship	
or E T 435	Senior Project	

Total Credits		12
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<sup>2</sup> E T 420 Senior Internship must be carried out within a renewable energy field. E T 435 Senior Project must be related to a renewable energy application.

## Concentration: Digital Forensics

Students can fulfill the Digital Forensics Concentration requirements by completing the following four courses.

### Technical Requirements

ICT 450	Ethical Hacking	3
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E T 255	Linux System Administration	3
E T 339	Introduction to Digital Forensics and Incident Response	3
E T 439	Advanced Digital Forensics and Incident Response	3
Total Credits		12

### Concentration: Information Security Technology

Students can fulfill the Information Security Technology Concentration requirements by completing the following four courses.

#### Technical Requirements

C S 478	Computer Security	3
BCIS 482	Management of Information Security	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
Total Credits		12

Top of Page (p. 615)

## Engineering Technology - Information - Bachelor of Science in Engineering Technology

Information Engineering Technology (IET) (<https://et.nmsu.edu/academics/information-engineering-technology-iet>) focusing on the study related to “information engineering” – its principles, technologies, networks, and applications. It is a vibrant discipline that has a tremendous impact on the economy as well as society. Information Engineering covers the following areas:

- Computer Programming and Coding,
- Database Technology,
- Telecommunications & Networking,
- Internet Technologies & Applications,
- Operating Systems Technology,
- Digital Forensics, and
- Information Security.

The Information Engineering Technology program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information>) by the Engineering Technology Accreditation Commission (ETAC) of ABET [www.abet.org](http://www.abet.org) (<http://www.abet.org>)

### Requirements (121 Total Credits)

#### General Education

##### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective (ENGL 218G Recommended) <sup>1</sup>		3
Oral Communications Elective (COMM 265G Recommended) <sup>1</sup>		3

##### Area II: Mathematics - see below

##### Area III: Laboratory Science - courses must be 4cr. with a lab

Select 8 credits from Biology, Chemistry, or Physics electives (with Lab) <sup>1</sup>	8
Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts: Select 15 total credits from Area IV and V, with at least 6 credits from each area. <sup>1</sup>	15

#### Institution Specific General Education

Viewing a Wider World Electives <sup>1</sup>	6
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#### Program Specific Requirements

##### Mathematics

MATH 235	Calculus for the Technical Student I	3
or MATH 191G	Calculus and Analytic Geometry I	
MATH 236	Calculus for the Technical Student II	3
or MATH 192G	Calculus and Analytic Geometry II	

##### Technical

ENGR 100	Introduction to Engineering	3
A ST 311	Statistical Applications	3
BCIS 350	Information Systems Analysis and Design	3

BCIS 480	E-Commerce Security	3
Upper Division Business Elective (300 and above)		3
Technical Electives (200 or above)- see advisor or preapproved list <sup>2</sup>		3
Technical Electives (300 or above) - see advisor or preapproved list <sup>2</sup>		6

##### Engineering Technology

E T 182	Digital Logic	3
E T 160	Introduction to Information Engineering Technology	3
E T 203	Computational Foundations	3
or C S 278	Discrete Mathematics for Computer Science	
E T 245	Computer Hardware Fundamentals	3
E T 255	Linux System Administration	3
E T 262	Software Technology I	3
E T 339	Introduction to Digital Forensics and Incident Response	3
E T 344	Microcomputer Systems	3
E T 362	Software Technology II	3
E T 410	Senior Seminar	1
E T 377	Computer Networking I	3
or E T 277	Computer Networking I for IET	
E T 435	Senior Project	3
E T 439	Advanced Digital Forensics and Incident Response	3
E T 458	Database Technology for Engineering	3
E T 463	Advanced Linux and Python Scripting	3
E T 464	Advanced Windows Server Administration	3
E T 477	Computer Networking II	3

Total Credits	118
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<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> Technical electives must be taken from a preapproved list which you can find in the ET office or online (<https://et.nmsu.edu/academics/information-engineering-technology-iet>). Other choices require advisor and/or department head approval

## Concentration: Information Security Technology

Concentrations are "optional" educational sequences that students may choose to focus on particular areas related to their major. Concentrations may often be done without additional credits by judicious use of electives and other optional course requirements.

Students can fulfill the Information Security Technology Concentration requirements by completing the following four courses:

### Technical Requirements

C S 478	Computer Security	3
BCIS 482	Management of Information Security	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
Total Credits		12

Top of Page

# Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology

MET (<https://et.nmsu.edu/academics/mechanical-engineering-technology-met>) majors learn theory and applications in the fields of manufacturing, product design and development, power systems, machinery, and fluid technology. Our students take courses in mechanisms and machines, computer aided modeling, heat transfer, and instrumentation, to name a few. They find employment in the design and testing of tools, engines, machines, and other complex mechanical devices. MET represents one of the broadest engineering technology disciplines. Our MET students also learn by designing and racing mini-baja cars, designing and constructing machines to help our farmers, and even building systems in other countries.

The Mechanical Engineering Technology program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information>) by the Engineering Technology Accreditation Commission (ETAC) of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>)

## Requirements (124 Total Credits)

### General Education

#### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective (ENGL 218G Recommended) <sup>1</sup>		3
Oral Communications Elective (COMM 265G Recommended) <sup>1</sup>		3

##### Area II: Mathematics - see below

##### Area III: Laboratory Science

CHEM 110G	Principles and Applications of Chemistry	4
PHYS 211G	General Physics I	3

or PHYS 215G	Engineering Physics I	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 215GL	Engineering Physics I Laboratory	

Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts: Select 15 total credits from Area IV and V, with at least 6 credits from each area: 15

#### Area IV: Social and Behavioral Sciences:

ECON 251G	Principles of Macroeconomics (Strongly Recommended)	
or ECON 252G	Principles of Microeconomics	

#### Area V: Humanities and Fine Arts:

#### Institution Specific General Education

Viewing a Wider World Electives (must be from two different Colleges)<sup>1</sup> 6

#### Strongly Recommended Courses:

Elective I: Select one Business Administration, Business Law, Marketing, Finance or Management Elective

Elective II: Select one from the following:

AG E 337V	Natural Resource Economics	
EPWS 380V	Science & Society	
PHYS 303V	Energy and Society in the New Millennium	

PHIL 323V	Engineering Ethics (strongly recommended)	
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HIST 302V	Science in Modern Society	
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### Program Specific Requirements

#### Mathematics

MATH 235	Calculus for the Technical Student I	3
or MATH 191G	Calculus and Analytic Geometry I	
MATH 236	Calculus for the Technical Student II	3
or MATH 192G	Calculus and Analytic Geometry II	

#### Natural Science

PHYS 212G	General Physics II	3
or PHYS 216G	Engineering Physics II	
PHYS 212GL	General Physics II Laboratory	1
or PHYS 216GL	Engineering Physics II Laboratory	

#### Technical

A ST 311	Statistical Applications	3
ENGR 100	Introduction to Engineering	3
I E 451	Engineering Economy	3
Technical Electives - must be upper division and pre-approved <sup>3</sup>		9

#### Engineering Technology

E T 110	Introduction to 3-D Modeling (Solid Works) <sup>2</sup>	3
E T 182	Digital Logic <sup>2</sup>	3
E T 190	Applied Circuits <sup>2</sup>	4
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	4
E T 210	Intermediate 3-D Modeling (Solid Works)	3
E T 240	Applied Statics	3
E T 241	Applied Dynamics	3
E T 262	Software Technology I <sup>2</sup>	3
E T 305	Introduction to Product Design <sup>2</sup>	3

E T 306 & 306 L	Fundamental and Applied Thermodynamics and Thermodynamics Lab	4
E T 308 & 308 L	Fluid Technology and Fluid Technology Lab	4
E T 310 & 310 L	Applied Strength of Materials and Applied Strength of Materials Lab	4
E T 328	Kinematics of Machines <sup>2</sup>	3
E T 396	Heat Transfer and Applications <sup>2</sup>	3
E T 402	Instrumentation	3
E T 410	Senior Seminar	1
E T 426	Analysis and Design of Machine Elements <sup>2</sup>	3
E T 435	Senior Project <sup>2</sup>	3
Total Credits		124

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

<sup>2</sup> Courses with built-in laboratory component.

<sup>3</sup> See a MET advisor or the pre-approved list in the ETSE office.

### Concentration: Renewable Energy Technologies

#### Requirements

<b>Select four courses from the following:</b>		12
C E 256	Environmental Engineering and Science	
C E 356	Fundamentals of Environmental Engineering	
CHME 486	Biofuels	
E T 365	Building Utilities	
E T 381	Renewable Energy Technologies	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
E T 401	Heating and Air-Conditioning Systems	
or M E 401	Heating/Air-Conditioning System	
E T 435	Senior Project	
or E T 420	Senior Internship	
Total Credits		12

\* E T 420 Senior Internship must be completed within a field of renewable energy field and/or ET 435 Capstone or Senior Design Project must be related to a renewable energy application.

## Geomatics - Bachelor of Science in Geomatics

Geomatics (<https://et.nmsu.edu/academics/surveying-engineering>) (previously known as Surveying Engineering) in the College of Engineering at NMSU emphasizes the techniques and science of measuring the terrestrial and three-dimensional position of points on, above, and below the earth's surface and the distance and angles between them at a high level of precision to aid in the design of infrastructure including roads, bridges and legal boundaries for ownership as well as to meet the educational requirements for

employment in industry and registration as a Professional Land Surveyor in the State of New Mexico.

When performing this work, professionals must have an understanding of: the science of geomatics measurement and analysis; the legal principles of boundary location; the laws related to boundaries and land use; and applicable mathematical and computational theories and principles. Geomatics professionals may work for private surveying, construction, and engineering firms, for City, County, State or Federal Highway Departments, for State Lands Commissions, for the US Forest Service and for the US Bureau of Land Management as examples.

The mission of the Department of ETSE is to provide men and women with the rigorous, fundamental education needed to enter and succeed in the Geomatics and related professions. To accomplish this mission, the department will introduce students to the theory and application of recognized geomatics principles.

See the entire **ET/SUR Course Listing**. (p. 606) Beginning Fall 2018 - the Geomatics degree will be offered online as a degree completion program

## Requirements (120 Credits)

### General Education

#### State of New Mexico Common Core

##### Area I: Communications

ENGL 111G	Rhetoric and Composition	4
Written Communications Elective (ENGL 218G Recommended) <sup>1</sup>		3
Oral Communications Elective (COMM 265G Recommended) <sup>1</sup>		3

##### Area II: Mathematics

MATH 191G	Calculus and Analytic Geometry I	4
Laboratory Sciences		
PHYS 215G	Engineering Physics I	3
or PHYS 211G	General Physics I	
PHYS 215GL	Engineering Physics I Laboratory	1
or PHYS 211GL	General Physics I Laboratory	
PHYS 216G	Engineering Physics II	3
or PHYS 212G	General Physics II	
PHYS 216GL	Engineering Physics II Laboratory	1
or PHYS 212GL	General Physics II Laboratory	
Choose from GEOL 111G, GEOL 212G, GEOG 111G, C S 171G, ASTR 110G, ASTR 105G		4

### Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts: Select 15 total credits from Area IV and V, with at least 6 credits from each area:

Area IV: Social and Behavioral Sciences: (ECON 251G or 252G recommended)

Area V: Humanities and Fine Arts:

<i>Two Viewing a Wider World (VWW) Electives (must be from two different colleges) <sup>1</sup></i>		6
PHIL 323V	Engineering Ethics (required or equivalent Ethics course)	

### Program Specific Requirements

#### Mathematics

MATH 192G	Calculus and Analytic Geometry II	4
MATH 280	Introduction to Linear Algebra	3
or MATH 480	Matrix Theory and Applied Linear Algebra	

STAT 371 or A ST 311	Statistics for Engineers and Scientists I Statistical Applications	3
<i>Technical</i>		
ENGR 100	Introduction to Engineering	3
DRFT 109 or DRFT 153	Computer Drafting Fundamentals Survey Drafting Applications	3
BLAW 325 or BLAW 316	Real Estate Principles and Law I Legal Environment of Business	3
E T 262 or OECS 192	Software Technology I C++ Programming I	3
<i>Surveying Engineering</i>		
SUR 222 or DRFT 222	Plane Surveying Surveying Fundamentals	3
SUR 264 or GEOG 381	Introduction to LIS Cartography and Geographic Information Systems	3
SUR 292	Public Land Survey System Boundaries	3
SUR 312	Legal Principles and Boundary Law I	3
SUR 328	Construction Surveying & Automation Technologies	3
SUR 322 or SUR 285	Laser Scanning Mapping Technologies Precise Digital Mapping	3
SUR 351	Introductory Spatial Data Adjustment I	3
E T 355	Site/Land Development and Layout	3
SUR 361	Introduction to Geodesy/Geodetic Control Surveying	3
SUR 451	Advanced Survey Measurements, Analysis, and Adjustments	3
SUR 452	Spatial Data Integration and Analysis	3
SUR 461	GNSS Positioning	3
SUR 464	Legal Principles and Boundary Law II	3
SUR 498	Emerging Technology in Geomatics	3
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)	4
I E 451	Engineering Economy	3
E T 420 or E T 421	Senior Internship Senior Project	2
Total Credits		120

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.

## Information and Communication Technology - Bachelor of Information and Communication Technology (120 credits)

Information and Communication Technology (ICT) (<https://et.nmsu.edu/academics/information-and-communication-technology-ict>) is a **distance education degree completion program**. The program focuses on the knowledge and experience that is required to design, implement and manage a variety of information systems. The curriculum includes the study of

- networking and network security

- computer hardware,
- application and operating systems software,
- system integration,
- database design and management,

Graduates of the program can expect to enter the workforce with titles that include Information Technologist, Systems or Network Administrator, Project Manager, Database Administrator and Computer Support Specialist.

The ICT program is a distance education program and does not require any on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with, and access to:

- a high speed Internet connection,
- a sound card, 4G of RAM minimum,
- a microphone/Webcam
- Microsoft Operating System and Office ®.

This program was not designed to be an engineering or engineering technology program, although there is significant overlap with the engineering technology IET program offered by the department. Thus, the ICT program differs from all other baccalaureate programs offered by departments in the College of Engineering. The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (<https://accreditation.nmsu.edu>) of the North Central Association of Colleges and Schools.

The program is designed to be a two-year degree completion educational path to a baccalaureate degree for graduates of computer and technology-related associate degree programs from community colleges or other two-year institutions. It is also a viable degree path for students who have completed the freshmen and sophomore years of computer or technology-related programs at four-year institutions including New Mexico State University.

### General Education : State of New Mexico Common Core

<i>Area I: Communications</i>	
English Composition (for example ENGL 111G)	4
Written Communications Elective (for example ENGL 218G) <sup>1</sup>	3
Oral Communications Elective (for example COMM 265G) <sup>1</sup>	3
<i>Area II: Mathematics - see College Algebra below</i>	
<i>Area III: Laboratory Science</i>	
Two Laboratory Science Electives - each must be 4 credits with a lab component <sup>1</sup>	8
<i>Areas IV &amp; V: Social and Behavioral Sciences &amp; Humanities and Fine Arts</i>	
Select 15 total credits from Areas IV and V, with at least six credits from each area: <sup>1</sup>	15
Area IV: Social and Behavioral Sciences:	
Area V: Humanities and Fine Arts:	
<b>Electives</b>	
Select 30 credits from typical content courses from an A S or AAS	30
<b>Institution Specific General Education</b>	
Viewing a Wider World Electives (must be from two different colleges) <sup>1</sup>	6

**Misc**

PC Maintenance or Computer Hardware	3
College Algebra (for example MATH 121G)	3
Object Oriented Programming ( such as Java, for example ICT 352)	3

**Program Specific Requirements - ICT courses**

ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Server Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
ICT 458	Database Design and Applications	3
ICT 460	Web Technologies and Multimedia	3
ICT 462	Remote Access Operating Systems with Linux	3
ICT 463	Computer Systems Administration	3
ICT 477	Computer Networking II	3
Total Credits		120

<sup>1</sup> As a completion program, entering students **are expected to have completed two years of college-level work** and satisfied the following requirements: The General Education requirements (p. 46) as well as Viewing a Wider World (p. 48) courses.

<sup>2</sup> See the list of **pre-approved** upper division electives or contact an ICT faculty advisor/mentor.

## Digital Electronic Applications - Undergraduate Minor

A grade of C- (or better) is required in each course (may not be taken S/U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their technical electives.

**For non-ECET majors****Required Courses**

E T 182	Digital Logic	3
E T 282	Digital Electronics	4
E T 362	Software Technology II	3
E T 344	Microcomputer Systems	3
E T 398	Digital Systems	3
E T 444	Hardware and Software Senior Design	3
Total Credits		19

## Digital Forensics - Undergraduate Minor

A grade of C- (or better) is required in each class. No courses may be taken S/U. All prerequisites must be met before enrolling in a class.

Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives.

**For non-IET majors**

<b>Required Courses</b>		12
E T 255	Linux System Administration	
E T 339	Introduction to Digital Forensics and Incident Response	
E T 439	Advanced Digital Forensics and Incident Response	
ICT 450	Ethical Hacking	
<b>Select two from the following list:</b>		6-7
E T 435	Senior Project (topic must be preapproved and related to security) <sup>1</sup>	
E T 463	Advanced Linux and Python Scripting	
ICT 320	Introduction to Internet Protocols	
ICT 457	Introduction to Information Security Technology	
PHYS 304	Forensic Physics	
Total Credits		18-19

## Geomatics - Undergraduate Minor

Geomatics involves the application of knowledge to the analysis, design and execution of mapping, geomatics, geospatial information systems, and surveying. When performing this work, professionals must have an understanding of: the science of geomatic measurement and analysis; the legal principles of boundary location; the laws related to boundaries and land use; and applicable mathematical and computational theories and principles. Geomatics is made up of positional accuracy, land planning and development concepts pertinent to subdivision science. Geomatics professionals work for private surveying or engineering firms, for City, County, State or Federal Highway Departments, for State Lands Commissions, for the US Forest Service and for the US Bureau of Land Management, among others.

The mission of the Department of ETSE is to provide men and women with the rigorous, fundamental education needed to enter and succeed in the Geomatics and related professions. To accomplish this mission, the department will introduce students to the theory and application of recognized geomatics principles.

**Required 12 credits from:** 12

Note: SUR 222 or DRFT 222 is required prerequisite for several of these courses

SUR 292	Public Land Survey System Boundaries
SUR 312	Legal Principles and Boundary Law I
SUR 322	Laser Scanning Mapping Technologies
or SUR 285	Precise Digital Mapping
SUR 361	Introduction to Geodesy/Geodetic Control Surveying

**Select 6 credits from:** 6

SUR 328	Construction Surveying & Automation Technologies
SUR 351	Introductory Spatial Data Adjustment I
E T 355	Site/Land Development and Layout
SUR 461	GNSS Positioning
GEOG 373	Introduction to Remote Sensing

or GEOG 381	Cartography and Geographic Information Systems	
GEOG 481	Fundamentals of Geographic Information Science and Technology (GIS & T)	
Total Credits		18

## Information Security Technology - Undergraduate Minor

A grade of C- or better is required in each course (no courses may be taken S/U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives.

### Required Courses

ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
BCIS 482	Management of Information Security	3
C S 478	Computer Security	3
<b>Elective - Select two from the following:</b>		6-7
ICT 320	Introduction to Internet Protocols	
C J 424	Forensic Law	
PHYS 304	Forensic Physics	
PHIL 323V or C J 425	Engineering Ethics Issues in Ethics, Law, and Criminal Justice	
E T 435	Senior Project (must be preapproved and information security topic)	
Total Credits		18-19

## Manufacturing - Undergraduate Minor

The *Manufacturing Minor* provides students with an augmenting skillset to better facilitate entry-level employment in manufacturing related industries. Students completing the *Minor* also acquire specialized knowledge needed for successful pursuit of a career in the manufacturing sector.

Typical skills gained from *Manufacturing Minor* coursework include: management and coordination of manufacturing processes, design for manufacturing, fabrication and assembly, product design and development, product specification, operations planning, scheduling, material handling, quality control, testing, evaluation and product validation.

A grade of C- or better is required in each course (may not be taken S/U). All prerequisites must be met before enrolling in a course. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives.

### Required Courses: Select one manufacturing course with any accompanying/embedded lab from the following:

E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	3-4
I E 217 & 217 L	Manufacturing Processes and Manufacturing Processes Laboratory	
M E 222	Introduction to Product Development	

Select one from the following:		3
MGT 335V	Business and Government	
MGT 344	Production and Operations Management	
MGT 345V	Quality and Competitiveness: An International Perspective	

Select four from the following:		12
E T 305	Introduction to Product Design	
E T 317	Advanced 3-D Modeling and Design	
E T 415	Manufacturing Management and Productivity	
E T 480	Innovation and Product Development	
E T 482	Advanced Manufacturing	

Total Credits 18-19

## Renewable Energy Technologies - Undergraduate Minor

A grade of C- or better is required in each course (no courses may be taken S/U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. Students may receive credit for only one special topic course (must be renewable content) or internship.

### Required Courses

Select any three from the required list		9
E T 381	Renewable Energy Technologies <sup>3</sup>	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	

Select 6 credits from the following list: 6

Any extra course from the required list		
C E/E S 256	Environmental Engineering and Science	
C E 356	Fundamentals of Environmental Engineering	
CHME 486	Biofuels	
E T 365	Building Utilities	
E T 396	Heat Transfer and Applications	
or M E 341	Heat Transfer	
E T 456	Applied Power Technologies <sup>3</sup>	
or E E 230	AC Circuit Analysis and Introduction to Power Systems	
E T/M E 401	Heating and Air-Conditioning Systems	
WERC 300	Introduction to Pollution Prevention and Its Application	
E E 426	Introduction to Smart Grid	
I E 490	Selected Topics <sup>1</sup>	
C E 498	Special Topics <sup>1</sup>	
E T 420	Senior Internship <sup>1</sup>	
E T 435	Senior Project <sup>1</sup>	
E T 440	Senior Design	
E T 441	Senior Project	

Select 3 credits from the following:<sup>2</sup> 3

AEEC 590	Special Topics <sup>1</sup>
AG E 337V	Natural Resource Economics
AG E 420	Special Problems <sup>1</sup>
ECON 337V	Natural Resource Economics
E T 360V	Technology in Business and Society
ECON 384V	Water Resource Economics
EPWS 380V	Science & Society
HIST 302V	Science in Modern Society
PHYS 303V	Energy and Society in the New Millennium
<hr/>	
Total Credits	18

<sup>1</sup> Must be related to a renewable energy field and preapproved by faculty advisor.

<sup>2</sup> If the selected class is outside the student's college it may also satisfy a Viewing a Wider World requirement.

<sup>3</sup> Not available for ECET majors as a required course. Select from other choices

## Industrial Engineering

### Undergraduate Program Information

Industrial engineers design, develop, install and improve integrated systems. This could be for people, equipment, information, financial resources, software, materials or energy. Industrial engineers work in a variety of manufacturing, health care, utility, retail, government and research settings, therefore the tools and methods of the industrial engineer are both varied and broad. They use knowledge and skills in engineering, mathematics, and physical and social sciences. Industrial engineers also use principles and methods of engineering analysis and design to monitor and improve such systems. New Mexico State University's undergraduate degree program in Industrial Engineering prepares students to join the work force or pursue graduate education while setting the foundation for life-long learning.

Specifically, graduates of the program will be:

- able to apply various industrial engineering techniques in an integrated fashion to solve real world problems in process design and/or improvement;
- able to obtain meaningful employment or enroll in a graduate program; and
- prepared for a long-term, successful career sustained by life-long learning experiences

In addition, the Engineering Accreditation Commission of ABET, Inc. criteria in conjunction with the Institute of Industrial Engineers, requires that:

- baccalaureate degree graduates will be able to demonstrate the ability to design, develop, implement and improve integrated systems that include people, materials, information, equipment and energy;
- industrial engineering curriculums include in-depth instruction allowing students to accomplish the integration of systems using appropriate analytical, computational and experimental practices; and
- that faculty teaching in industrial engineering departments show evidence of understanding professional practice and maintain currency in their respective professional areas. Program faculty

must have responsibility and sufficient authority to define, revise, implement and achieve program objectives.

## Graduate Program Information

The Department of Industrial Engineering offers graduate work leading to the degrees of Master of Science in Industrial Engineering and Doctor of Philosophy with specialization in industrial engineering. Areas of emphasis include

- computer modeling,
- operations research and systems engineering,
- manufacturing systems,
- quality and reliability engineering.

Departmental admission requirements in addition to those of the Graduate School must be considered on an individual basis because of the diversity of backgrounds of applicants in the program. An applicant should meet or correspond directly with the department as a first step in determining his or her specific admission status. Applicants should present mathematics preparation equivalent to 9 credits of calculus for engineers, 3 credits of differential equations, and 3 credits of calculus-based probability and statistics.

Minimum credit-hour requirements for the master's degree may be met in any of the following ways:

1. 24 semester credits approved course work and 6 semester credits of thesis (I E 599 Master's Thesis) for a total of 30 semester credits,
2. 27 semester credits approved course work and 3 semester credits of project (I E 598 Special Research Programs) for a total of 30 semester credits, or
3. 30 semester credits of approved course work.

Approved course work must meet all requirements of the Graduate School, represent a consistent master's program in relation to a student's graduate study goals as determined through consultation with the graduate program adviser, and be approved by a program committee of the graduate faculty of the department. Programs in the focus areas of engineering management, computer modeling, operations research or manufacturing engineering can be developed with the aid of a faculty advisor.

Departmental facilities and equipment are available to support research efforts of graduate students, including computer terminals and laboratories. In addition to departmental facilities, supporting facilities such as the Manufacturing Technology and Engineering Center and five interdisciplinary Research Clusters are available for research work.

The Ph.D. program is research oriented with the final product being the dissertation. The general information (p. 53) chapter in this catalog describes the Ph.D. The program in industrial engineering also includes the following additions:

- the course work must include at least 12 credits at the 500 level in a related field,
- 6 credits of 600-level research courses covering two areas, and
- 18 credits of 700-level courses following successful completion of the comprehensive examination.

The department does not have any foreign language or research tool requirements. Interested individuals should correspond directly with the department to determine eligibility for admission.

## Degrees for the Department

Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 627)

Industrial Engineering - Master of Science in Industrial Engineering (p. 628)

Engineering - Doctor of Philosophy (p. 628)

Systems Engineering - Graduate Certificate (p. 628)

## Minors for the Department

Entrepreneurship - Undergraduate Minor (p. 628)

**Associate Professor, Edward Pines, Department Head**

**Associate Professors** Mullen, Pines, Sohn, Valles-Rosales; **Assistant Professors** Kammerdiner, Razzaghi

*E. Pines, Department Head, Ph.D. (Penn State)– quality and continuous improvement, technology policy; H. Sohn, Ph.D. (University of Iowa)– operations research, discrete optimization, network design; J. Mullen, Ph.D. (Iowa State)– stochastic processes, quality, improvement, production system design; D. J. Valles-Rosales, Ph.D. (New Mexico State)– manufacturing systems, soft computing technologies, computer integrated manufacturing; A. Kammerdiner, Ph.D. (University of Florida)– statistical analysis, data mining, network science and combinatorial optimization; T. Razzaghi, PhD (Central Florida) Data modeling, health care systems engineering*

## Industrial Engineering Courses

### IE 110. Industrial Engineering Orientation

**1 Credit**

Introduction to Industrial Engineering Department, Faculty Research and Resources. Overview of where industrial engineering fits into larger view of all of engineering. Introduction to university resources for industrial engineering students. Restricted to majors.

### IE 151. Computational Methods in Industrial Engineering

**3 Credits**

History, social implications, and application of computers and an introduction to computer programming, word processing, and database management systems. Satisfies General Education computer science requirement.

**Prerequisite:** MATH 121G.

### IE 152. Introduction to Industrial Engineering

**2 Credits**

Historical development of industrial engineering, present practice and trends.

**Prerequisite:** MATH 120.

### IE 200. Special Problems-Sophomore

**1-3 Credits**

Directed individual projects. May be repeated for a total of 3 credits.

**Prerequisite:** consent of faculty member.

### IE 217. Manufacturing Processes

**2 Credits**

Manufacturing methods and industrial processes which include casting, forming and machining. May be repeated up to 2 credits. Crosslisted with: E T 217. M E 159.

**Prerequisite(s):** MATH 121G.

**Corequisite(s):** IE 217 L.

### IE 217 L. Manufacturing Processes Laboratory

**1 Credit**

Laboratory associated with IE 217. May be repeated up to 1 credits.

**Prerequisite(s):** M E 159.

### IE 300. Special Problems-Junior

**1-3 Credits**

Directed individual projects. May be repeated for a total of 3 credits.

**Prerequisite:** consent of faculty member.

### IE 311. Engineering Data Analysis

**3 Credits**

Methodology and techniques associated with identifying and analyzing industrial data. May be repeated up to 3 credits. C- or better in IE 151, C S 110, or equivalent.

**Prerequisite(s):** C- or better in MATH 192G.

### IE 316. Methods Engineering

**3 Credits (2+3P)**

Methods analysis and design. Work measurement techniques. Job evaluation and wage incentive methods. May be repeated up to 3 credits.

**Prerequisite(s):** IE 311, M E 159.

### IE 330. Environmental Management Seminar I

**1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 330, CH E 330, E E 330, E S 330, E T 330, M E 330 and WERC 330

### IE 351. Applied Problem Solving in Industrial Engineering

**3 Credits**

Application of computational techniques to engineering problems including the use of commercial programs in statistics and applied mathematics. Restricted to majors.

**Corequisite:** IE 311.

### IE 365. Quality Control

**3 Credits**

Statistical analysis of quality in manufacturing. Acceptance sampling and control charts.

**Prerequisite:** IE 311 or equivalent.

### IE 375. Manufacturing Processes II

**3 Credits**

Review of basic manufacturing processes. Advanced topics in casting, forming, machining and joining; major process parameters; economics of processes.

**Prerequisite:** IE 217 or E T 217.

### IE 381. Technology Ventures

**3 Credits**

This course looks at how new technology ventures are formed at the individual entrepreneur and corporate levels. It covers the development of science and engineering based ventures from ideas through creating customer value. This is the first course in the Entrepreneurship Minor. The roles of science and engineering specialists in the creation of customer value are defined in preparation for development of technology-based enterprises.

**I E 382. Business for the Practicing Engineer****3 Credits**

Business tools and skills, including technology commercialization, patent applications, preparing a technology-oriented business plan, reading and constructing financial documents, modeling and understanding markets, e-commerce, QFD, concurrent engineering, engineer's role in the global economy, and engineer's impact on product design and cost.

**Prerequisite:** engineering major, junior level or above.

**I E 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of faculty member.

**I E 411. Occupational Safety****3 Credits**

Practical methods to improve safety in the workplace. Topics include OSHA and other regulations, hazard recognition, assessment and control, industry standards, risk assessment and safety management. Material is applicable to a variety of workplace settings. This course is intended for College of Engineering students who have completed their lower-division requirements in mathematics, engineering, technology, and basic science. Same as I E 561 with differentiated assignments. **Prerequisite:** Junior standing

**I E 413. Engineering Operations Research I****3 Credits**

Deterministic operations research modeling including linear and integer programming. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 192G.

**Corequisite(s):** MATH 480.

**I E 423. Engineering Operations Research II****3 Credits**

Probabilistic operations research modeling, including queuing systems and their optimization; Markov chains. May be repeated up to 3 credits.

**Prerequisite(s):** I E 311.

**Corequisite(s):** MATH 392.

**I E 424. Manufacturing Systems****3 Credits**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling, and inventory control.

**Prerequisite:** I E 311.

**I E 451. Engineering Economy****3 Credits**

Discounted cash flows, economics of project, contract and specifications as related to engineering design.

**I E 453. Leadership and Motivation****3 Credits**

Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Same as MGT 453.

**Prerequisite:** MGT 309 or consent of instructor.

**I E 460. Evaluation of Engineering Data****3 Credits**

Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods.

**Prerequisite:** I E 311 or equivalent.

**I E 466. Reliability****3 Credits**

Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data.

**Prerequisite:** I E 311 or equivalent.

**I E 467. Discrete-Event Simulation Modeling****4 Credits**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments. Same as I E 567.

**Prerequisite:** I E 311 or equivalent.

**I E 478. Facilities Planning and Design****3 Credits**

Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies. Pre/

**Prerequisite:** I E 316.

**Corequisite:** I E 424.

**I E 480. Senior Design****3 Credits (2+3P)**

Multi-disciplinary team design project for external clients. Involves semester long activities including major design report and presentation.

**Prerequisites:** senior standing, I E 467.

**I E 490. Selected Topics****1-3 Credits**

May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of the head of the department.

**I E 505. Directed Readings****1-3 Credits**

May be repeated for a maximum total of 6 credits.

**Prerequisite:** consent of the head of the department.

**I E 515. Stochastic Processes Modeling****3 Credits**

Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting.

**Prerequisites:** I E 311 or equivalent; and MATH 392 or equivalent.

**I E 522. Queuing Systems****3 Credits**

Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications.

**Prerequisite:** I E 311 or equivalent.

**I E 523. Advanced Engineering Economy****3 Credits**

Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523.

**I E 524. Advanced Production and Inventory Control****3 Credits**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments.

**I E 525. Systems Synthesis and Design****3 Credits**

Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities.

**I E 530. Environmental Management Seminar****1 Credit**

Same as C E 530, E E 530, CH E 530.

**I E 531. Fundamentals of Operations Research Techniques****3 Credits**

Key concepts, terminology, paradigms, and methods of operations research: Linear programming including assignment and transportation algorithms; stochastic analysis, including inventory control and queuing systems; general approaches, including goal, integer, nonlinear and dynamic programming.

**I E 533. Linear Programming****3 Credits**

Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis.

**I E 534. Nonlinear Programming****3 Credits**

Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods. Prerequisite: MATH 192G or equivalent

**I E 535. Discrete Optimization****3 Credits**

Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms.

**I E 537. Large Scale Systems Engineering****3 Credits**

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making.

**I E 539. Fundamentals of Transportation and Routing in Logistics****3 Credits**

Introduction to the conceptual, methodological, and mathematical foundations of transportation and routing problems in logistics system. Emphasis on mathematical modeling and computational algorithms.

**I E 545. Characterizing Time-Dependent Engineering Data****3 Credits**

Theory and techniques employed in the characterization of stochastic processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed.

**Prerequisite:** I E 311 or equivalent.

**I E 561. Advanced Safety Engineering****3 Credits**

Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis.

**Prerequisite:** graduate status in engineering.

**I E 563. Topics in Engineering Administration****3 Credits**

Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.

**I E 567. Design and Implementation of Discrete-Event Simulation****3 Credits**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.

**I E 571. Advanced Quality Control****3 Credits**

Advanced topics in quality control and design of experiments for improvement of quality.

**Prerequisite:** I E 311 or equivalent.

**I E 575. Advanced Manufacturing Processes****3 Credits**

Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions.

**Prerequisite:** graduate standing.

**I E 590. Selected Topics****1-3 Credits**

May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of the head of the department.

**I E 598. Special Research Programs****1-3 Credits**

Individual analytical or experimental investigations. May be repeated for a maximum total of 6 credits.

**Prerequisite:** consent of instructor.

**I E 599. Master's Thesis****15 Credits**

Thesis.

**I E 610. Topics in Operations Research****3 Credits**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

**I E 620. Topics in Computer Modeling****3 Credits**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

**I E 630. Topics in Engineering Management****3 Credits**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

**I E 690. Selected Topics****1-15 Credits**

May be repeated.

**Prerequisite:** consent of department head.**I E 700. Doctoral Dissertation****15 Credits**

Dissertation.

**Office Location:** 201 Foreman Engineering Complex**Phone:** (575) 646-4923**Website:** <http://ie.nmsu.edu/>

# Industrial Engineering - Bachelor of Science in Industrial Engineering Requirements (126 credits)

In addition to the university requirements for graduation, a student must have a 2.0 grade-point average in all departmental courses.

**General Education****State of New Mexico Common Core***Area I: Communications*

ENGL 111G	Rhetoric and Composition	4
ENGL 218G	Technical and Scientific Communication	3
Oral Communications Elective <sup>1</sup>		3

*Area II: Mathematics*

MATH 191G	Calculus and Analytic Geometry I	4
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*Area III: Natural Sciences*

CHEM 111G	General Chemistry I	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1

*Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts*

Select 15 total credits from Area IV and V, with at least 6 credits from each area: <sup>1</sup>	15
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Area IV: Social and Behavioral Sciences:

Select 6-9 credits from Economics, Political Science, Psychology, Sociology and Anthropology electives<sup>1</sup>

Area V: Humanities and Fine Arts:

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, and Religion electives<sup>1</sup>*Institution Specific General Education*

Viewing a Wider World Electives <sup>1</sup>	6
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**Program Specific Requirements***Mathematics*

MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
MATH 392	Introduction to Ordinary Differential Equations	3
MATH 480	Matrix Theory and Applied Linear Algebra	3

*Natural Science Electives* 7

CHEM 112G	General Chemistry II
or PHYS 216G/216GL	Engineering Physics II

Choose one of

GEOL 111G	Introductory Geology
BIOL 211G	Cellular and Organismal Biology
PHYS 217	Heat, Light, and Sound

*Engineering*

C E 233	Mechanics-Statics	3
or M E 236	Engineering Mechanics I	
CHME 361	Engineering Materials	3
ENGR 100	Introduction to Engineering	3
M E 159	Graphical Communication and Design	2

*Engineering Electives* 9

Choose one from the following

C E 234	Mechanics-Dynamics
C E 301	Mechanics of Materials
E E 201	Electric Circuit Analysis
M E 234	Mechanics-Dynamics
M E 237	Engineering Mechanics II
M E 240	Thermodynamics

Choose one 3 credit engineering course numbered 300 and above

One engineering elective (to bring total to 9 credits)

*Industrial Engineering*

I E 151	Computational Methods in Industrial Engineering	3
I E 217	Manufacturing Processes	2
I E 217 L	Manufacturing Processes Laboratory	1
I E 311	Engineering Data Analysis	3
I E 316	Methods Engineering	3
I E 351	Applied Problem Solving in Industrial Engineering	3
I E 365	Quality Control	3
I E 413	Engineering Operations Research I	3
I E 423	Engineering Operations Research II	3
I E 424	Manufacturing Systems	3
I E 451	Engineering Economy	3
I E 460	Evaluation of Engineering Data	3
I E 467	Discrete-Event Simulation Modeling	4
I E 478	Facilities Planning and Design	3
I E 480	Senior Design	3

Total Credits 126

<sup>1</sup> See the required courses (p. 46) section of the catalog for a full list of courses.<sup>2</sup> Students must complete 15 total credits from Area IV and V, with at least six credits from each area.**Recommended Freshman Year**

Course	Title	Credits
<b>Freshman</b>		
CHEM 111G	General Chemistry I	4
ENGL 111G	Rhetoric and Composition	4
ENGR 100	Introduction to Engineering	3

I E 151	Computational Methods in Industrial Engineering	3
M E 159	Graphical Communication and Design	2
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1
Area V: Humanities and Fine Arts		3
Area IV: Social/ Behavioral Sciences		3
Credits		34
Total Credits		34

## Entrepreneurship - Undergraduate Minor

The Entrepreneurship Minor is designed to promote entrepreneurship to students across the NMSU campus. The Department of Industrial Engineering coordinates an engineering cluster of electives to support the three required classes offered by the College of Business.

### Entrepreneurship

BLAW 330	Entrepreneurial Law	3
ENTR 331	Business Creation and Valuation	3
ENTR 332	Entrepreneurial Finance	3

### Engineering Electives

Select three classes from the following:

CHME 449	Intellectual Property for Engineers and Scientists	
E T 480	Innovation and Product Development	
I E 381	Technology Ventures	
I E 382	Business for the Practicing Engineer	

Total Credits 18

## Industrial Engineering - Master of Science in Industrial Engineering

The Department of Industrial Engineering offers the Master of Science in Industrial Engineering with focus areas of manufacturing, operations research and engineering management. Refer to <http://ie.nmsu.edu> for current program offerings and research areas.

## Engineering - Doctor of Philosophy

The Department of Industrial Engineering offers the Doctor of Philosophy in Engineering with a specialization in Industrial Engineering. Refer to <http://ie.nmsu.edu> for a program description and current research areas.

### Additional Requirements

PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department

Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

## Systems Engineering - Graduate Certificate

### Program Availability

This distance education program is available to working professionals who have undergraduate degrees in engineering, engineering technology, and related fields. It is also an option for persons with graduate degrees who seek career renewal. Systems engineering provides a unique opportunity for working professionals to integrate their work experience with advanced class work.

### Program Objectives

The objectives of this program are:

- To provide technical professionals an opportunity to advance their careers through advanced education in systems engineering.
- To develop and improve relationships with the College of Engineering's constituencies by offering a program that addresses a known need for professional graduate-level development.
- To provide an opportunity for non-traditional students to consider advancing their education in areas that will foster their career development.
- To enable program students to become aware of current faculty research in systems engineering areas.

### Requirements

A 3.0 minimum cumulative GPA in four courses as described below will be required for award of the Systems Engineering Graduate Certificate Program.

### Admission to the NMSU Graduate School

Students must apply and be admitted to NMSU as a non-degree student to take classes. For more information, contact:

NMSU Graduate School  
Box 30001, MSC 3G  
Las Cruces, NM 88003  
(575) 646-2736  
<http://gradschool.nmsu.edu/gradcat.html>

To complete the Certificate Program, students must be admitted to the Graduate School as certificate students. If you are considering pursuing a degree in electrical or industrial engineering, you should contact that department for admissions requirements and advising.

### Academic Content

<b>Required Courses</b>		<b>6</b>
E E 461	Systems Engineering and Program Management	
I E 537	Large Scale Systems Engineering	
<b>Electives (six credits form the following):</b>		<b>6</b>

*Track 1- Modeling, Simulation & Decisions*

I E 490	Selected Topics
I E 531	Fundamentals of Operations Research Techniques
I E 545	Characterizing Time-Dependent Engineering Data
I E 567	Design and Implementation of Discrete-Event Simulation

*Track 2 - Applications*

E E 460	Space System Mission Design and Analysis
I E 525	Systems Synthesis and Design
E E 585	Telemetry Systems
E E 590	Selected Topics

*Track 3 - Systems Analysis*

I E 466	Reliability
I E 522	Queuing Systems
I E 571	Advanced Quality Control

Total Credits 12

Other courses may be substituted by approval of your advisor and the program director.

## Mechanical Engineering and Aerospace Engineering Undergraduate Program Information

The mission of the Mechanical and Aerospace Engineering Department at New Mexico State University is threefold:

- to educate those who will advance knowledge and become the future leaders of industry and academia;
- to conduct both basic and applied research in mechanical and aerospace engineering and related interdisciplinary areas; and
- to provide service to the profession, to the State of New Mexico, to the country, and to the future development of engineering worldwide.

A critical focus within the department is to afford undergraduates of varying backgrounds and abilities every opportunity for achieving success in the mechanical and aerospace engineering professions. To address this focus, the faculty of the Mechanical and Aerospace Engineering Department, with input from other constituents, have established the following program educational objectives that inform the overall undergraduate programs:

- Our graduates will gain relevant employment and/or pursue a graduate degree.
- Our graduates will advance in their level of workplace responsibility.

## Graduate Program Information

Graduate programs of study are available leading to the degrees of

- Master of Science and Doctor of Philosophy in Aerospace Engineering,
- the Master of Science in Mechanical Engineering, and
- the Doctor of Philosophy in Engineering with a concentration in Mechanical Engineering.

Areas of active research in mechanical engineering include the following:

- experimental fluids with application to wind power,
- computational fluid dynamics,
- energy systems and components,
- thermal management,
- space transportation,
- modeling and analysis of machining processes,
- micromechanics and cross property connections,
- computational mechanics with application to material properties,
- renewable energy,
- nonlinear dynamics and vibration,
- reduced order modeling in multibody dynamics,
- structural dynamics and fluids,
- robotics,
- composite materials and nanomaterials.

Areas of active research in aerospace engineering include the following:

- computational, theoretical and experimental aerodynamics,
- vortex dynamics,
- flow control,
- aeroelasticity and flutter,
- space dynamics and control,
- spacecraft motion estimation,
- rarefied gasdynamics and space propulsion,
- ground simulation of reduced gravity environments,
- structural health monitoring, and
- unmanned aerial systems.

Laboratory facilities supporting graduate research include a large subsonic wind tunnel, a large water channel, a robotics, controls and UAS lab, a reduced gravity simulation lab, a space dynamics and controls lab, and a composite materials lab. A mechanical testing lab is also available in the College of Engineering.

In addition to fulfilling the basic requirements for admission to the Graduate School, applicants are expected to have an undergraduate degree equivalent to a BS in mechanical or aerospace engineering from a university accredited by ABET. Graduate students whose BS degree is in a discipline other than A E or M E will normally be required to take undergraduate courses in M E or A E in order to prepare for graduate course work; such undergraduate preparatory work will be determined by the graduate coordinator on a case by case basis. A candidate for the master's degree can choose one of two options: a thesis option or a course-only option. Both options require a minimum of 30 credits of graduate study.

Doctoral candidates must complete a program of study determined by the student and his or her advisory committee. The student must successfully pass a written qualifying examination (administered during the student's first year of full-time study) and an oral comprehensive examination administered after approximately 80 percent of the course work is completed. The student must submit and defend an acceptable dissertation based on independent investigation in a field of study approved by the advisory committee. The requirements for the MS and Ph.D. degrees are stated below.

## Degrees for the Department

Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 635)

Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 637)

Aerospace Engineering - Master of Science in Aerospace Engineering (p. 639)

Mechanical Engineering - Master of Science in Mechanical Engineering (p. 640)

Aerospace Engineering - Doctor of Philosophy (p. 640)

Engineering - Doctor of Philosophy (p. 641)

## Minors for the Department

Aerospace Engineering - Undergraduate Minor (p. 638)

Mechanical Engineering - Undergraduate Minor (p. 639)

**Professor, Ruey-Hung Chen, Department Head**

**Associate Professor, Fangjun Shu, Associate Department Head**

**Professor** Chen, Chaitanya, Sevostianov; **Associate Professors** Choo, Conley<sup>1</sup>, Garcia, Lee, Y. H. Park, Shashikanth, Shu; **Assistant Professors** Abdelkefi, Drach, Gross, Kota, Kuravi, H. J. Park, Sun

*Ruey-Hung Chen, Department Head, Ph.D. (Michigan)– combustion and propulsion, gas dynamics and supersonic flows, phase-change heat and mass transfer; V. Chaitanya, Ph.D. (Johns Hopkins)– materials characterization, materials degradation, corrosion, electrochemistry, failure analysis, energy; A. Abdelkefi, Ph.D. (Virginia Tech)– nonlinear dynamics, energy harvesting, aeroelasticity, fluid-structure interaction, vibration and controls; V. K. S. Choo, Ph.D. (Liverpool)– composite materials, computer applications; E. G. Conley,<sup>1</sup> Ph.D. (Michigan State)– optics and experimental mechanics; B. Drach, Ph.D. (New Hampshire)– mechanics of composite materials, multi-scale modeling and characterization; G. V. Garcia, Ph.D. (Texas A&M)– damage detection, experimental mechanics, vibration; A. Gross, DEngr. (Aachen)– computational fluid mechanics, active flow control, and numerical methods; K. Kota, Ph.D. (Central Florida)– heat transfer enhancement, energy efficiency, thermal-fluid interaction on engineered surfaces; S. Kuravi, Ph.D. (Central Florida)– renewable energy, thermal systems, concentrating solar power, thermal desalination, energy storage; Y. S. Lee, Ph.D. (Illinois Urbana - Champaign)- aeroelastically, fluid-structure interaction, nonlinear system identification; Y. H. Park, Ph.D. (Iowa)– design optimization, computational solid mechanics, atomistic and molecular simulations; H. J. Park, Ph.D. (Michigan)– dynamics, optimal control; I. Sevostianov, Ph.D. (St. Petersburg, Russia)– micromechanics of materials, mechanics of biomaterials, mathematical physics; B. Shashikanth, Ph.D. (Southern California)– fluid mechanics, dynamical systems, controls; F. Shu, Associate Department Head, Ph.D. (Purdue)– experimental fluid dynamics, biofluidics and turbulent flow; L. Sun, Ph.D. (Brigham Young)– unmanned systems, towed cable systems, sensor network, cooperative estimation and control, optimal control.*

<sup>1</sup> Registered Professional Engineer (State other than NM)

## Aerospace Engineering Courses

### A E 102. Introduction to Aerospace Engineering

#### 1 Credit

A survey course of aeronautical, aerospace, and astronomical engineering, with an emphasis on basic aerospace concepts and major aerospace principles without going into detailed math and analysis. Students are given the opportunity to listen to guest speakers and participate in projects utilizing the NMSU Ultralight and NMSU wind tunnel. Restricted to: Main campus only.

### A E 339. Aerodynamics I

#### 3 Credits

Fluid properties, conservation equations, incompressible 2-dimensional flow; Bernoulli's equation; similarity parameters; subsonic aerodynamics: lift and drag, analysis and design of airfoils. May be repeated up to 3 credits. Restricted to: A E majors.

**Prerequisite(s):** M E 234 or M E 237 and M E 228 or MATH 392.

### A E 362. Orbital Mechanics

#### 3 Credits

Dynamics of exoatmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories. May be repeated up to 3 credits.

**Prerequisite(s):** M E 228 or MATH 392, M E 234 or M E 237, and M E 261.

### A E 363. Aerospace Structures

#### 3 Credits

Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques. Prerequisites: C E 301

### A E 364. Flight Dynamics and Controls

#### 3 Credits

Fundamentals of airplane flight dynamics, static trim, and stability; spacecraft and missile six degree of freedom dynamics; attitude control of spacecraft. May be repeated up to 3 credits.

**Prerequisite(s):** M E 228 or MATH 392, M E 234 or M E 237, and M E 261.

### A E 400. Undergraduate Research

#### 1-3 Credits (1-3)

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite(s):** Consent of faculty member.

### A E 405. Special Topics

#### 3 Credits

Topics of modern interest to be offered by the departmental staff. Consent of instructor required.

### A E 419. Propulsion

#### 3 Credits

Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. Prerequisites: A E 439

### A E 424. Aerospace Systems Engineering

#### 3 Credits

Basic principles of top down systems engineering and current practice; preliminary and detailed design of aircraft and space vehicles, including requirement, subsystem interaction, and integration, tradeoffs, constraints and non-technical aspects.

**Prerequisite(s):** A E 362.

**A E 428. Aerospace Capstone Design****3 Credits**

Team Project-analysis, design, hands-on build test, evaluate.

**Prerequisite(s)/Corequisite(s):** A E 447. Prerequisite(s): A E 363 and A E 424.

**A E 439. Aerodynamics II****3 Credits**

Principles of compressible flow, momentum and energy conservation; thermal properties of fluids; supersonic flow and shock waves; basics of supersonic aerodynamics.

**Prerequisite(s):** A E 339, M E 240, and M E 328.

**A E 447. Aerofluids Laboratory****3 Credits (2+3P)**

Use of subsonic wind tunnels and other flow to study basic flow phenomena and methods of fluid measurement and visualization.

**Prerequisite(s)/Corequisite(s):** A E 439. Prerequisite(s): M E 345.

**A E 451. Aircraft Design****3 Credits**

Conceptual design of aircraft based on existing designs, empirical relationships, and theory. Dimensioning, structural design, and performance analysis of major subcomponents such as fuselage, wing, and propulsion system. Static stability and control analysis.

**Prerequisite(s):** A E 339 and A E 363.

**A E 464. Advanced Flight Dynamics and Controls****3 Credits**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile/rocket control systems, and guidance systems.

**Prerequisite(s):** A E 364 or consent of instructor.

**A E 509. Individualized Study****3 Credits**

Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to A E & M E majors.

**A E 510. Special Topics****1-6 Credits (1-6)**

Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.

**A E 527. Control of Mechanical Systems****3 Credits**

Rigorous introduction to the control of dynamical systems, with a focus on mechanical systems. Includes basic systems theory, controllability, feedback and stabilization, observers and dynamic feedback, and applications of methods to systems of importance in mechanical engineering. Consent of instructor required. Cross-listed with: M E 527

**A E 529. Nonlinear and Optimal Control****3 Credits**

Introduction to optimal control theory, Pontryagin's Maximum Principle, control of simple mechanical systems, Lagrangian and Hamiltonian methods, introduction to geometric control-Lie algebras, distributions, controllability and observability. Cross-listed with: M E 529

**A E 552. Introduction to Gasdynamics****3 Credits**

Gas kinetics, rarefied gas dynamics, collision dynamics; velocity distribution function, finite rate chemical process; thermal nonequilibrium and chemically reacting flows; introduction to quantum and statistical mechanics; Boltzmann equation and the BGK model; moments of the Boltzmann Equation; the Navier-Stokes Equation; the structure of shock waves.

**A E 562. Astrodynamics****3 Credits**

Two-body problem, orbit analysis, and classical orbit determination methods; trajectory design and optimization; orbital maneuvers using impulsive or continuous thrust; relative motion and rendezvous; perturbations and Lagrange planetary equations; interplanetary mission design including gravity assists; introduction to the three-body problem, halo orbits, and invariant manifolds in mission design.

**A E 564. Advanced Flight Dynamics and Controls****3 Credits**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile / rocket control systems, and guidance systems May be repeated up to 3 credits.

**Prerequisite(s):** A E 364 or consent of instructor.

**A E 598. Special Research Programs****1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to A E & M E majors.

**A E 599. Master's Thesis****15 Credits (15)**

Thesis. Graded: Thesis/Dissertation.

**A E 600. Doctoral Research****1-15 Credits (1-15)**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Dissertation.

**A E 700. Doctoral Dissertation****15 Credits (15)**

Dissertation. Graded: Thesis/Dissertation.

## Mechanical Engineering Courses

**M E 102. Mechanical Engineering Orientation****1 Credit**

Emphasis on tours of M E labs and NMSU facilities that illustrate possible career paths for mechanical engineers. Students are introduced to department faculty, student organizations, and support services at NMSU. Topics include role of good communication skills, using modern technology, team building, and intellectual property. Students are advised in planning balance of their academic program. Restricted to majors.

**M E 159. Graphical Communication and Design****2 Credits (1+3P)**

Sketching and orthographic projection. Covers detail and assembly working drawings, dimensioning, tolerance specification, and design projects. Pre/

**Corequisite(s):** MATH 190G.

**M E 201. Supplemental Instruction to Dynamics****1 Credit**

Optional workshop for students in M E 237. The workshop focuses on problem solving skills associated with M E 237. Course does not count toward departmental degree requirements. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

**Corequisite(s):** M E 237.

**M E 202. Supplemental Instruction to Thermodynamics****1 Credit**

Optional workshop for students in ME 240. The workshop focuses on problem solving skills associated with ME240. Course does not count toward departmental degree requirements. Restricted to Las Cruces campus only.

**Corequisite(s):** M E 240.

**M E 210. Electronics and System Engineering****3 Credits (2+3P)**

Introduction to microcontrollers, measurement systems, motion actuators, sensors, electric circuits, and electronic devices and interfacing. Students required to work individually and in teams to design and test simple electromechanical systems. Restricted to Las Cruces campus only.

**Prerequisite(s):** MATH 192.

**M E 222. Introduction to Product Development****3 Credits (2+3P)**

Introduction to modern methods used in the realization of products. Traditional manufacturing processes, such as metal stamping, turning, milling, and casting are reviewed. Modern methods of rapid prototyping and model making are discussed in context of computer-aided design. Techniques for joining metals, plastics, and composites are discussed. Role of quality control is introduced.

**Prerequisite:** M E 159.

**M E 228. Engineering Analysis I****3 Credits**

Introduction to engineering analysis with emphasis on engineering applications. Topics include ordinary differential equations, linear algebra, and vector calculus with focus on analytical methods. Restricted to Las Cruces campus only.

**Prerequisite(s):** MATH 291.

**M E 234. Mechanics-Dynamics****3 Credits**

Kinematics and dynamic behavior of solid bodies utilizing vector methods.

**Prerequisite(s)/Corequisite(s):** MATH 291G. Prerequisite(s): C E 233.

**M E 236. Engineering Mechanics I****3 Credits**

Force systems, resultants, equilibrium, distributed forces, area moments, friction, and kinematics of particles. Pre/ Restricted to: Main campus only.

**Prerequisite(s):** MATH 192G.

**Corequisite(s):** PHYS 215G.

**M E 237. Engineering Mechanics II****3 Credits**

Kinetics of particles, kinematics and kinetics rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies in three dimensions. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 291. Prerequisite(s): M E 236 or C E 233.

**M E 240. Thermodynamics****3 Credits**

First and second laws of thermodynamics, irreversibility and availability, applications to pure substances and ideal gases.

**Prerequisite:** PHYS 215G.

**M E 261. Mechanical Engineering Problem Solving****3 Credits (2+3P)**

Introduction to programming syntax, logic, and structure. Numerical techniques for root finding, solution of linear and nonlinear systems of equations, integration, differentiation, and solution of ordinary differential equations will be covered. Multi function computer algorithms will be developed to solve engineering problems.

**Prerequisite(s):** MATH 192.

**M E 301. Supplemental Instruction to Engineering Analysis II****1 Credit**

Optional workshop for students in ME 328. The workshop focuses on problem solving skills associated with ME328. Course does not count toward departmental degree requirements. May be repeated up to 1 credits.

**Corequisite(s):** M E 328.

**M E 302. Fluids Supplemental Instruction****1 Credit**

Optional workshop for students in ME 338 or AE 339. The workshop focuses on problem solving skills associated with fluid mechanics. Course does not count toward departmental degree requirements.

**Corequisite(s):** M E 338 or A E 339.

**M E 326. Mechanical Design****3 Credits**

Design methodology and practice for mechanical engineers. May be repeated up to 3 credits.

**Prerequisite(s):** M E 234 or M E 237 and C E 301.

**M E 328. Engineering Analysis II****3 Credits**

Advanced engineering analysis with emphasis on engineering applications. Topics include systems of ordinary differential equations, Fourier analysis, partial differential equations, and functions of complex variable with focus on analytical methods. May be repeated up to 3 credits.

**Prerequisite(s):** M E 228 or MATH 392.

**M E 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Restricted to M E majors. Crosslisted with: C E 330, CH E 330, E E 330, E S 330, I E 330, WERC 330 and E T 330

**M E 331. Intermediate Strength of Materials****3 Credits**

Covers stress and strain, theories of failure, curved flexural members, flat plates, pressure vessels, buckling, and composites. May be repeated up to 3 credits.

**Prerequisite(s):** C E 301 and M E 328 or MATH 392.

**M E 332. Vibrations****3 Credits**

Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange s equations. Dynamic stability. Controls. Matrix iteration. May be repeated up to 3 credits.

**Prerequisite(s):** M E 328, M E 234 or M E 237, and M E 261.

**M E 333. Intermediate Dynamics****3 Credits**

Three dimensional kinematics and kinetics, orbital motion, Lagrange's equations, dynamic stability, and controls. May be repeated up to 3 credits.

**Prerequisite(s):** M E 328 and M E 234 or M E 237.

**M E 338. Fluid Mechanics****3 Credits**

Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations continuity, energy, and momentum to fluid systems. May be repeated up to 3 credits. Restricted to: M E majors.

**Prerequisite(s):** M E 234 or M E 237 and M E 228 or MATH 392.

**M E 340. Applied Thermodynamics****3 Credits**

Thermodynamic cycles, Maxwell relations, Gibbs and Helmholtz functions, mixtures, psychometrics, chemical reactions, chemical equilibrium.

**Prerequisite:** M E 240.

**M E 341. Heat Transfer****3 Credits**

Fundamentals of conduction, convection, and radiation. Design of heat transfer systems. May be repeated up to 3 credits.

**Prerequisite(s):** M E 240, M E 338 or A E 339, and M E 228 or MATH 392.

**M E 345. Experimental Methods I****3 Credits (2+3P)**

Emphasis on experimental techniques, basic instrumentation, data acquisition and analysis, and written presentation of results. Includes experiments in dynamics and deformable body mechanics. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C E 301. **Prerequisite(s):** M E 228 or MATH 392, M E 210, and M E 234 or M E 237.

**M E 349. MAE Career Seminar****1 Credit**

Seminar course covering topics relevant to mechanical and aerospace engineering juniors (job placement, interviewing techniques, resume preparation, etc.). Restricted to: M E and A E majors.

**Prerequisite(s):** Junior Standing.

**M E 400. Undergraduate Research****1-3 Credits**

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of faculty member.

**M E 401. Heating/Air-Conditioning System****3 Credits**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. May be repeated up to 3 credits.

**Prerequisite(s):** M E 340 and M E 341.

**M E 405. Special Topics****3 Credits**

Topics of modern interest to be offered by the departmental staff. May be repeated up to 12 credits.

**Prerequisite(s):** Senior standing.

**M E 425. Design of Machine Elements****3 Credits**

Design of machine elements through the application of mechanics. Fatigue and theories of failure. Design projects assigned.

**Prerequisite(s):** M E 326.

**M E 426. Design Project Laboratory I****3 Credits**

Students address a design problem in which innovation and attention to detail are emphasized. Solution of the problem entails applications of mechanics and/or the thermal sciences.

**Prerequisite(s)/Corequisite(s):** M E 425.

**M E 427. Design Project Laboratory II****3 Credits**

Continuation of M E 426.

**Prerequisite:** M E 426.

**M E 445. Experimental Methods II****3 Credits (2+3P)**

Emphasis on experimental techniques, instrumentation and data acquisition in fluid mechanics, heat transfer, and thermodynamics. Laboratory results will be presented in written and verbal formats.

**Prerequisite(s):** (M E 338 or A E 339), M E 340, M E 341, and M E 345.

**M E 449. Mechanical Engineering Senior Seminar****1 Credit**

Senior seminar course covering topics relevant to graduating mechanical engineering seniors (job placement, interviewing techniques, resume preparation).

**Prerequisite:** senior standing.

**M E 452. Introduction to Automation and Control System Design****3 Credits (2+3P)**

Control system design and implementation. Emphasis on practical applications of traditional control algorithms to mechanical engineering applications in thermofluid systems and mechanical systems. Design of feedback analog and digital control systems. Introduction to robots and automation. Lab assignments include programming industrial robotic and automation systems. May be repeated up to 3 credits.

**Prerequisite(s):** M E 328 and M E 234 or M E 237, or consent of instructor.

**M E 456. Experimental Modal Analysis****3 Credits**

Emphasis on hands-on techniques for structural vibration tests for practical applications. Interpretation of experimental results by means of advanced signal processing tools, basic system identification methodology, and reduced-order modeling procedures. May be repeated up to 3 credits.

**Prerequisite(s):** M E 332, M E 228 or MATH 392, and M E 261, or consent of instructor.

**M E 460. Applied Finite Elements****3 Credits**

Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process. May be repeated up to 3 credits.

**Prerequisite(s):** M E 425.

**M E 481. Alternative and Renewable Energy****3 Credits**

Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed.

**Prerequisite(s):** M E 341, and (M E 338 or A E 339).

**M E 483. Introduction to Combustion****3 Credits**

Combustion is one of the most fundamental phenomena related to human activities, such as obtaining thermal energies. Fundamental phenomena and physics related to combustion will be discussed, including thermodynamics, chemical reactions; combustion kinetics, premixed and diffuse flames, and examples. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 112G, M E 228 or MATH 392, and M E 340.

**M E 487. Mechatronics****3 Credits (2+3P)**

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. May be repeated up to 3 credits.

**Prerequisite(s):** M E 210 or E E 201 and M E 345.

**M E 502. Elasticity I****3 Credits**

Introduction to stress tensor, strain tensor, constitutive law, energy theorems, plane stress and plane strain. Also covers torsion of shafts and propagation of stress waves in elastic solids.

**M E 503. Thermodynamics****3 Credits**

A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.

**M E 504. Continuum Mechanics****3 Credits**

Basic introduction to the Mechanics of Continuous Media. Its aim is to prepare the student for more advanced courses in Solid and Fluid Mechanics. The topics to be covered include: introduction to Cartesian tensors, tensor algebra and calculus; Lagrangian and Eulerian kinematics; Cauchy and Piola-Kirchhoff stresses; general principles of conservation; constitutive theory for ideal fluids, Newtonian and non-Newtonian fluids, finite and linear elasticity.

**M E 505. Fundamentals of the Theory of Plasticity****3 Credits**

Basic concepts in continuum mechanics, equations of the plastic state, equations of elastic-plastic equilibrium, criteria for yielding, initial and subsequent yield surfaces, two-dimensional and axi-symmetric plasticity problems, dynamic problems.

**Prerequisite(s):** M E 502.

**M E 509. Individualized Study****3 Credits**

Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.

**M E 510. Special Topics****1-6 Credits**

Topics in mechanical engineering. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of the department head.

**M E 511. Dynamics****3 Credits**

An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics.

**M E 512. Vibrations****3 Credits**

Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.

**M E 514. Advanced Composite Materials****3 Credits**

Study on the anisotropic elasticity, strength of anisotropic materials and micromechanics. Topics from micromechanics and macromechanics through lamination theory and examples of plate bending, buckling and vibration problems. Course taught on an as-needed basis.

**M E 517. Nonlinear Dynamics and Chaos****3 Credits**

Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincare maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos

**M E 518. Finite Element Analysis****3 Credits**

Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis.

**M E 520. Micromechanics****3 Credits**

The course covers fundamentals of micromechanics: point force solution, Eshelby's problem, various approximate methods to calculate effective material properties of inhomogeneous materials, variational principles of the mechanics of composites. The history of micromechanics is discussed from Navier and Cauchy to current state of the art.

**Prerequisite(s):** M E 502.

**M E 527. Control of Mechanical Systems****3 Credits**

Rigorous introduction to the control of dynamical systems, with a focus on mechanical systems. Includes basic systems theory, controllability, feedback and stabilization, observers and dynamic feedback, and applications of methods to systems of importance in mechanical engineering. Consent of Instructor required. Crosslisted with: A E527.

**Prerequisite(s):** M E 452 or equivalent, or consent of instructor.

**M E 529. Nonlinear and Optimal Control****3 Credits**

Introduction to optimal control theory, Pontryagin's Maximum Principle, control of simple mechanical systems, Lagrangian and Hamiltonian methods, introduction to geometric control-Lie algebras, distributions, controllability and observability

**M E 530. Intermediate Fluid Mechanics****3 Credits**

Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.

**M E 533. Computational and Theoretical Fluid Mechanics****3 Credits**

Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data.

**Prerequisite:** M E 530 or consent of instructor.

**M E 534. Advance Computational Fluid Dynamics****3 Credits**

Advanced techniques for large-scale numerical simulations of fluid flows: spectral numerical methods, including Fourier and other expansions, Galerkin and collocation projections, computational methods to solve incompressible and compressible Navier-Stokes equations, high-resolution methods for hyperbolic equations with discontinuous solutions, and issues related to implementation on supercomputers.

**Prerequisite(s):** M E 533.

**M E 536. Hydrodynamic Stability and Turbulence****3 Credits**

Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory

**Prerequisite(s):** M E 533.

**M E 540. Intermediate Heat Transfer****3 Credits**

Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level.

**M E 570. Engineering Analysis I****3 Credits**

Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods.

**M E 580. Engineering Analysis II****3 Credits**

Engineering analysis with emphasis on engineering applications. Topics include analytical and numerical methods in linear and nonlinear ordinary and partial differential equations.

**Prerequisite:** M E 570 or consent of instructor.

**M E 598. Special Research Programs****1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.

**M E 599. Master's Thesis****15 Credits**

Thesis.

**M E 600. Doctoral Research****1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

**M E 698. Special Research Programs****1-3 Credits**

May be repeated for a maximum of 6 credits.

**M E 700. Doctoral Dissertation****15 Credits**

Dissertation.

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**Website:** <http://mae.nmsu.edu/>

## Aerospace Engineering - Bachelor of Science in Aerospace Engineering

The aerospace engineering program prepares students for a range of professional engineering careers in aerospace and related professions. The aerospace engineering curriculum covers the important classical areas of low and high speed aerodynamics, propulsion, orbital mechanics, flight mechanics and control, aerospace structures and laboratory practice. In addition, the principles of systems engineering and design that are necessary to conceive, design, analyze and troubleshoot complex engineering systems are covered extensively and are considered to be especially important in the overall educational experience. Students will also be encouraged to participate in significant non-classroom experiences, including:

- co-ops and internships;
- industrial and laboratory field trips;
- guest speakers from outside NMSU;
- the New Mexico Space Grant Program;
- special seminar programs on current topics in aerospace.

Aerospace engineers find employment in areas of launch vehicles, space vehicles and missions, aircraft systems design, land and sea vehicle design, robotics and automated manufacturing, safety and other areas. The aerospace engineering background also allows graduates to pursue careers in non-aerospace fields of engineering. Graduates of the aerospace engineering program will be prepared to apply the following skills to problems of interest either in the industry or research and development:

- engineering sciences,
- mathematics,
- computational methods,
- modern experimental methods,
- effective communication skills and
- systems engineering principles.

The aerospace engineering program is also intended to prepare students to pursue graduate study, which can be of significant benefit in the aerospace profession. The general goals of the aerospace engineering program, as well as the program educational objectives, are the same as those stated above for the mechanical engineering program.

## Requirements (125 Credits)

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science, and engineering courses applied toward their BSAE and/or ME minor.

**General Education****State of New Mexico Common Core***Area I: Communications*

ENGL 111G	Rhetoric and Composition	4
	Written Communications Elective <sup>1</sup>	3
	Oral Communications Elective <sup>1</sup>	3

*Area II: Mathematics*

MATH 191G	Calculus and Analytic Geometry I	4
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*Area III: Natural Science*

CHEM 111G	General Chemistry I	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1

*Areas IV & V: Social and Behavioral Sciences & Humanities and Fine Arts*

Select 15 total credits from Area IV and V, with at least 6 credits from each area: <sup>1</sup>	15
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## Area IV: Social and Behavioral Sciences:

Select 6-9 credits from Economics, Political Science, Psychology, Sociology and Anthropology electives <sup>1</sup>

## Area V: Humanities and Fine Arts:

Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, and Religion electives <sup>1</sup>

*Institution Specific General Education*

Viewing a Wider World Electives <sup>2</sup>	6
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**Program Specific Requirements***Mathematics*

MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3

*Natural Science*

PHYS 216G	Engineering Physics II	3
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*Engineering*

ENGR 100	Introduction to Engineering	3
C E 301	Mechanics of Materials	3
CHME 361	Engineering Materials	3

*Mechanical Engineering*

M E 159	Graphical Communication and Design	2
M E 210	Electronics and System Engineering	3
M E 222	Introduction to Product Development	3
M E 228	Engineering Analysis I	3
M E 236	Engineering Mechanics I	3
M E 237	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
M E 328	Engineering Analysis II	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1

*Aerospace Engineering* <sup>3</sup>

A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3

A E 439	Aerodynamics II	3
A E 424	Aerospace Systems Engineering	3
A E 428	Aerospace Capstone Design	3
A E 447	Aerofluids Laboratory	3
Aerospace engineering senior elective (Approved M E 400 level and/or A E 400 level courses only)		3

Total Credits	125
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<sup>1</sup> See NM Common Core requirements (p. 46) in catalog for a full list of courses.

<sup>2</sup> See Viewing a Wider World requirements (p. 48) in catalog for a full list of courses.

<sup>3</sup> Courses subject to once per year rotation.

Course	Title	Credits
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**Freshman****Fall**

MATH 191G	Calculus and Analytic Geometry I	4
ENGR 100	Introduction to Engineering	3
CHEM 111G	General Chemistry I	4
M E 159	Graphical Communication and Design	2
ENGL 111G	Rhetoric and Composition	4
Credits		17

**Spring**

MATH 192G	Calculus and Analytic Geometry II	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1
M E 222	Introduction to Product Development	3
Written Communications Elective <sup>1</sup>		3
Area IV: Social/ Behavioral Sciences <sup>1</sup>		3
Credits		17

**Sophomore****Fall**

MATH 291G	Calculus and Analytic Geometry III	3
M E 236	Engineering Mechanics I	3
PHYS 216G	Engineering Physics II	3
M E 210	Electronics and System Engineering	3
M E 261	Mechanical Engineering Problem Solving	3
Credits		15

**Spring**

M E 228	Engineering Analysis I	3
M E 237	Engineering Mechanics II	3
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
Oral Communications Elective <sup>1</sup>		3
Credits		15

**Junior****Fall**

M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 364	Flight Dynamics and Controls	3
M E 349	MAE Career Seminar	1

Area IV: Social/ Behavioral Sciences <sup>1</sup>	3
Credits	16
<b>Spring</b>	
A E 424 Aerospace Systems Engineering	3
A E 439 Aerodynamics II	3
A E 363 Aerospace Structures	3
M E 345 Experimental Methods I	3
M E 341 Heat Transfer	3
Credits	15
<b>Senior</b>	
<b>Fall</b>	
CHME 361 Engineering Materials	3
A E 419 Propulsion	3
A E 447 Aerofluids Laboratory	3
Area V: Humanities and Fine Arts <sup>1</sup>	6
Credits	15
<b>Spring</b>	
A E 428 Aerospace Capstone Design	3
Aerospace engineering senior elective	3
Area IV or Area V <sup>1</sup>	3
Viewing a Wider World <sup>2</sup>	6
Credits	15
Total Credits	125

<sup>1</sup> See NM Common Core requirements (p. 46) in catalog for a full list of courses.

<sup>2</sup> See Viewing a Wider World requirements (p. 48) in catalog for a full list of courses.

## Mechanical Engineering - Bachelor of Science in Mechanical Engineering

The mechanical engineering program prepares students for a wide range of professional engineering careers in such areas as: research and development; design; facilities operation and maintenance; management; and production. Graduates of the program will be prepared to apply engineering sciences, mathematics, computational methods, modern experimental methods, and effective communication skills to problems of interest in industry as well as government or scholarly topics. Employment opportunities for graduates are extensive. These opportunities include: energy and utility; manufacturing; automotive; aerospace; defense and space; research and development; and many others. The emphasis in the curriculum is on engineering sciences (solid mechanics, thermal sciences, fluid mechanics and materials science); mathematics; engineering analysis; engineering design; general sciences; and communication balanced with general education topics and electives. Graduates of the program will also be prepared for graduate studies (subject to grade-point and standardized test qualifications). Students will be prepared to take the fundamentals of engineering examination (and are encouraged to do so) as a step towards professional registration.

### Requirements (125 Credits)

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math,

science and engineering courses applied toward their BSME and/or AE minor.

#### General Education

<b>State of New Mexico Common Core</b>		
<i>Area I: Communications</i>		
ENGL 111G	Rhetoric and Composition	4
Written Communications Elective <sup>1</sup>		3
Oral Communications Elective <sup>1</sup>		3
<i>Area II: Mathematics</i>		
MATH 191G	Calculus and Analytic Geometry I	4
<i>Area III: Natural Science</i>		
CHEM 111G	General Chemistry I	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1
<i>Areas IV &amp; V: Social and Behavioral Sciences &amp; Humanities and Fine Arts</i>		
Select 15 total credits from Area IV and V, with at least 6 credits from each area: <sup>1</sup>		15
Area IV: Social and Behavioral Sciences:		
Select 6-9 credits from Economics, Political Science, Psychology, Sociology and Anthropology electives <sup>1</sup>		
Area V: Humanities and Fine Arts:		
Select 6-9 credits from History, Philosophy, Literature, Art, Music, Dance, Theater, and Religion electives <sup>1</sup>		
<i>Institution Specific General Education</i>		
Viewing a Wider World Electives <sup>2</sup>		6
<b>Program Specific Requirements</b>		
<i>Mathematics</i>		
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
<i>Natural Science</i>		
PHYS 216G	Engineering Physics II	3
<i>Engineering</i>		
ENGR 100	Introduction to Engineering	3
C E 301	Mechanics of Materials	3
CHME 361	Engineering Materials	3
<i>Mechanical Engineering</i>		
M E 159	Graphical Communication and Design	2
M E 210	Electronics and System Engineering	3
M E 222	Introduction to Product Development	3
M E 228	Engineering Analysis I	3
M E 236	Engineering Mechanics I	3
M E 237	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
M E 326	Mechanical Design	3
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 340	Applied Thermodynamics	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1

M E 425	Design of Machine Elements	3
M E 426	Design Project Laboratory I	3
M E 427	Design Project Laboratory II	3
M E 445	Experimental Methods II	3
Select one Mechanics Elective from the following:		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
Mechanical engineering senior electives (Approved M E 400 level and/or A E 400 level courses only)		6
Total Credits		125

<sup>1</sup> See NM Common Core requirements (p. 46) in catalog for a full list of courses.

<sup>2</sup> See Viewing a Wider World requirements (p. 48) in catalog for a full list of courses.

Course	Title	Credits
<b>Freshman</b>		
<b>Fall</b>		
MATH 191G	Calculus and Analytic Geometry I	4
ENGR 100	Introduction to Engineering	3
CHEM 111G	General Chemistry I	4
M E 159	Graphical Communication and Design	2
ENGL 111G	Rhetoric and Composition	4
Credits		17
<b>Spring</b>		
MATH 192G	Calculus and Analytic Geometry II	4
PHYS 215G	Engineering Physics I	3
PHYS 215GL	Engineering Physics I Laboratory	1
M E 222	Introduction to Product Development	3
Written Communications Elective <sup>1</sup>		3
Area IV: Social/ Behavioral Sciences <sup>1</sup>		3
Credits		17

**Sophomore**

<b>Fall</b>		
MATH 291G	Calculus and Analytic Geometry III	3
M E 236	Engineering Mechanics I	3
PHYS 216G	Engineering Physics II	3
M E 210	Electronics and System Engineering	3
M E 261	Mechanical Engineering Problem Solving	3
Credits		15
<b>Spring</b>		
M E 228	Engineering Analysis I	3
M E 237	Engineering Mechanics II	3
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
Oral Communications Elective <sup>1</sup>		3
Credits		15

**Junior**

<b>Fall</b>		
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3

CHME 361	Engineering Materials	3
M E 340	Applied Thermodynamics	3
M E 349	MAE Career Seminar	1
Area IV: Social/ Behavioral Sciences <sup>1</sup>		3
Credits		16

**Spring**

M E 326	Mechanical Design	3
Mechanics Elective		3
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
Area V: Humanities and Fine Arts <sup>1</sup>		3
Credits		15

**Senior****Fall**

M E 426	Design Project Laboratory I	3
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Area IV or Area V <sup>1</sup>		3
Area V: Humanities and Fine Arts <sup>1</sup>		3
Credits		15

**Spring**

M E 427	Design Project Laboratory II	3
Mechanical engineering senior electives		6
Viewing a Wider World <sup>2</sup>		6
Credits		15
Total Credits		125

<sup>1</sup> See NM Common Core requirements (p. 46) in catalog for a full list of courses.

<sup>2</sup> See Viewing a Wider World requirements (p. 48) in catalog for a full list of courses.

## Aerospace Engineering - Undergraduate Minor

**Requirements**

<i>Math and Science</i>		
MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
PHYS 215G	Engineering Physics I	3
<i>Required Engineering</i>		
C E 301	Mechanics of Materials	3
M E 236	Engineering Mechanics I	3
M E 237	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
<i>Technical Electives <sup>1</sup></i>		
Select one from the following:		3
A E 364	Flight Dynamics and Controls	
A E 439	Aerodynamics II	
Select one from the following:		3

A E 362	Orbital Mechanics	
A E 363	Aerospace Structures	
A E 419	Propulsion	
Total Credits		38

<sup>1</sup> Technical Electives cannot be used to satisfy BSME Engineering elective requirement.

## Mechanical Engineering - Undergraduate Minor

### Requirements

#### Math and Science

MATH 191G	Calculus and Analytic Geometry I	4
MATH 192G	Calculus and Analytic Geometry II	4
MATH 291G	Calculus and Analytic Geometry III	3
PHYS 215G	Engineering Physics I	3

#### Required Engineering

C E 301	Mechanics of Materials	3
M E 236	Engineering Mechanics I	3
M E 237	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 425	Design of Machine Elements	3

#### Technical Elective <sup>1</sup>

Select one from the following:		3
M E 452	Introduction to Automation and Control System Design	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
M E 481	Alternative and Renewable Energy	
M E 487	Mechatronics	

Total Credits 38

<sup>1</sup> Technical Elective cannot be used to satisfy BSAE Engineering elective requirement.

## Aerospace Engineering - Master of Science in Aerospace Engineering

Students may select one of two options for completing their MS degree. Selection of a particular option must be made during the first semester of study in conjunction with selecting a permanent adviser.

### Thesis Option

#### Requirements

M E 570	Engineering Analysis I	3
Select at least 18 credits of A E graduate courses <sup>1</sup>		18
Select one or both from the following:		
A E 509	Individualized Study	3
A E 510	Special Topics <sup>2</sup>	6
Total Credits		30

<sup>1</sup> Up to 6 credits of M E graduate courses may be substituted with the approval of the Graduate Coordinator. All course must be 500 level or above.

<sup>2</sup> Special topics courses offered formally on a one time basis.

**Publication Requirement:** a refereed conference paper accepted or a refereed journal article in review or accepted by graduation. The MS thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

### Coursework Option

#### Requirements

M E 570	Engineering Analysis I	3
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#### Core Courses

Select one core course from 4 of the 5 following topic areas: 12

#### Space Dynamics

A E 562	Astroynamics	
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#### Aerodynamics

Select one from the following:

M E 530	Intermediate Fluid Mechanics	
M E 533	Computational and Theoretical Fluid Mechanics	
A E 552	Introduction to Gasdynamics	

#### Structural Dynamics and Control

Select one from the following:

M E 512	Vibrations	
A E 527	Control of Mechanical Systems	

#### Mechanics

Select one from the following:

M E 502	Elasticity I	
M E 504	Continuum Mechanics	

#### Engineering Analysis

Select one from the following:

M E 518	Finite Element Analysis	
M E 580	Engineering Analysis II	

#### Additional Requirements

Select 4 additional A E courses (500 level or above) from the following: <sup>3</sup> 12

Core Courses listed above		
Research Area Courses		
A E 509	Individualized Study	
A E 510	Special Topics	

Select one course (500 level or above) from related areas <sup>4</sup> 3

Total Credits 30

<sup>3</sup> Graduate M E courses may be substituted for A E courses with the approval of the Graduate Program Coordinator.

<sup>4</sup> If course is not in A E or M E program, approval of the Graduate Program Coordinator is required.

## Selection of MS Option and Permanent Adviser

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all coursework and thesis work for the thesis option, or all coursework for the course-only option.

## Mechanical Engineering - Master of Science in Mechanical Engineering (30 credits)

Students may select one of two options for completing their MS degree. Selection of a particular option must be made during the first semester of study in conjunction with selecting a permanent adviser.

### Thesis Option

#### Requirements

M E 570	Engineering Analysis I	3
Select at least 18 credits of M E graduate courses <sup>1</sup>		18
Select one or both from the following:		
M E 509	Individualized Study	3
M E 510	Special Topics <sup>2</sup>	6
Total Credits		30

<sup>1</sup> Up to 6 credits of A E graduate courses may be substituted with the approval of the Graduate Coordinator. All course must be 500 level or above.

<sup>2</sup> Special topics courses offered formally on a one time basis.

**Publication Requirement:** a refereed conference paper accepted or a refereed journal article in review or accepted by graduation. The MS thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

### Coursework Option

#### Requirements

M E 570	Engineering Analysis I	3
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#### Core Courses

Select one core course from 4 of the 5 following topic areas:	12
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#### Solid Mechanics

Select one from the following:

M E 502 Elasticity I

M E 504 Continuum Mechanics

#### Thermal Science

Select one from the following:

M E 503 Thermodynamics

M E 540 Intermediate Heat Transfer

#### Fluids

Select one from the following:

M E 530 Intermediate Fluid Mechanics

M E 533 Computational and Theoretical Fluid Mechanics

#### Dynamics and Vibrations

Select one from the following:

M E 511 Dynamics

M E 512 Vibrations

#### Engineering Analysis and Control

Select one from the following:

M E 518 Finite Element Analysis

M E 527 Control of Mechanical Systems

M E 580 Engineering Analysis II

#### Additional Requirements

Select 4 additional M E courses (500 level or above) from the following: <sup>3</sup> 12

Core Courses listed above

Research Area Courses

Dual Listed Courses

M E 509 Individualized Study

M E 510 Special Topics

Select one course (500 level or above) from related areas <sup>4</sup> 3

Total Credits 30

<sup>3</sup> Graduate A E courses may be substituted for M E courses with the approval of the Graduate Program Coordinator.

<sup>4</sup> If course is not in A E or M E program, approval of the Graduate Program Coordinator is required.

## Selection of MS Option and Permanent Adviser

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's adviser.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all coursework and thesis work for the thesis option, or all coursework for the course-only option.

## Aerospace Engineering - Doctor of Philosophy

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Aerospace Engineering. The Degree of Doctor of Philosophy is

indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Aerospace Engineering. Students must follow the degree requirements listed below to complete the Ph.D. course of study.

- A minimum of 36 credit hours of coursework (500 level or above) beyond the Bachelor of Science degree, at least 18 of which must support the student's research area.
- A minimum of 24 credit hours of research, A E 700 Doctoral Dissertation, which may include a maximum of 6 credit hours of A E 600 Doctoral Research. A E 600 Doctoral Research is intended for those students who have not completed the qualification examination, a prerequisite for A E 700 Doctoral Dissertation.
- A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The Ph.D. dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

### Ph.D. Program Transfer Credits

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

### Selection of Permanent Ph.D. Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the Ph.D. written qualifying examination, the Ph.D. written and oral comprehensive examination, the student's Ph.D. committee, and the Ph.D. dissertation are contained in the department's Graduate Program website.

### Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

## Engineering - Doctor of Philosophy

### Concentration: Mechanical Engineering

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Mechanical Engineering. The Degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Mechanical Engineering. Students must follow the degree requirements listed below to complete the Ph.D. course of study.

- A minimum of 36 credit hours of coursework (500 level or above) beyond the Bachelor of Science degree, at least 18 of which must support the student's research area.
- A minimum of 24 credit hours of research, M E 700 Doctoral Dissertation, which may include a maximum of 6 credit hours of M E 600 Doctoral Research. M E 600 Doctoral Research is intended for those students who have not completed the qualification examination, a prerequisite for M E 700 Doctoral Dissertation.
- A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The Ph.D. dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

### Ph.D. Program Transfer Credits

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

### Selection of Permanent Ph.D. Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the Ph.D. written qualifying examination, the Ph.D. written and oral comprehensive examination, the student's Ph.D. committee, and the Ph.D. dissertation are contained in the department's Graduate Program website.

### Additional Requirements

PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

# COLLEGE OF HEALTH AND SOCIAL SERVICES

Dean - *Donna Wagner*

Associate Dean for Academic Affairs - *Karen Kopera-Frye*

Development Officer - *Kassie Ckudre*

Director of Finance - *Aida Lopez*

Coordinator of Student and Academic Programs - *Patrick Mendoza*

The College of Health and Social Services brings together associated disciplines and professional fields of study directly applied to the improvement of the quality of life and its existence in rapidly changing family and community environments. The college includes the Department of Public Health Sciences, and the Schools of Nursing and Social Work.

## Bachelor Degree Graduation Requirements

Three bachelor degree programs are available. To be awarded a bachelor degree in any of the three programs (i.e., Bachelor of Public Health, Bachelor of Science in Nursing, and Bachelor of Social Work) you must:

1. Complete the requirements for the degree as shown by the department in which the degree is offered including a minimum of 48 credits of upper-division courses (numbered 300 and above) and the minimum total number of credits required for the degree.
2. Complete the general education common core (p. 46) presented in the general education section of this catalog, the specific general education courses that may be required by each department, and Viewing a Wider World requirements specified elsewhere in this catalog.<sup>1</sup>
3. Complete any other requirements for graduation as discussed under Regulations in the General Information chapter of this catalog.

<sup>1</sup> Students must check with their academic advisor for current requirements and lists of specific courses that meet these requirements.

While the ultimate responsibility for planning an academic program in compliance with university, college, and departmental requirements rests with you, the college recognizes the importance of helping you work out appropriate academic programs. All Health and Social Service students pursuing baccalaureate degrees are advised about academic matters in their respective department. Students are encouraged to contact departments for specific subject area information and career planning.

## Bachelors Degrees

**Bachelor of Public Health** (p. 661)

**Bachelor of Science in Nursing** (p. 652)

**Bachelor of Social Work** (p. 668)

## Masters Degrees

**Master of Public Health** (p. 662)

- Community Health Education
- Health Management, Administration, & Policy

**Master of Science in Nursing - Nursing Administration** (p. 653)

**Master of Social Work** (p. 669)

## Dual Degrees

Master of Public Health/ Master of Social Work (p. 660)

## Graduate Certificates

- Family Nurse Practitioner (p. 651)
- Psychiatric/Mental Health Nurse Practitioner (p. 652)
- Graduate Public Health (p. 661)

## Doctoral Degrees

**Doctor of Nursing Practice** (p. 654)

- Adult/Geriatric Nurse Practitioner
- Family Nurse Practitioner
- Psychiatric/Mental Health Nurse Practitioner
- Public/Community Health Nursing

Doctor of Philosophy-Nursing (p. 653)

## Undergraduate Minors

- Gerontology (p. 660)
- Public Health Sciences (p. 662)
- U.S.-Mexico Border Health Issues (p. 663)

## Graduate Minors

- Alcohol and Drug Counseling (p. 671)

## Accreditation

Within the College of Health and Social Services, the baccalaureate degree program in the School of Nursing is accredited by the Commission of Collegiate Nursing Education (CCNE). The baccalaureate degree program in the School of Social Work is accredited by the Council on Social Work Education. The Bachelor of Public Health and Masters of Public Health degree programs in the Department of Public Health Sciences are accredited by the Council on Education for Public Health (CEPH).

## Nursing

### Undergraduate Program Information

NMSU's School of Nursing offers a Bachelor of Science in Nursing (BSN) degree. The degree plan provides three options to accommodate either the beginning nursing student, the beginning nursing student with a baccalaureate degree in another field, or the returning registered nurse. Students graduating from the first two options are eligible to take the NCLEX-RN® examination for licensure as a registered nurse upon completion of their program of studies. This program is also offered at two additional satellite sites at NMSU Grants, NM and NMSU Alamogordo, NM. Option three is designed for the registered nurse who wishes to complete a BSN.

The BSN degree program is approved by the New Mexico Board of Nursing and accredited by the Commission on Collegiate Nursing Education (CCNE). Approval by the New Mexico Board of Nursing is required for graduates to be eligible to take the National Council Licensing Examination (NCLEX-RN®) for licensure as a registered nurse. Accreditation by the CCNE assures prospective students and employers that the program has met national education standards.

The NMSU SON is a full member of the New Mexico Nursing Education Consortium (NMNEC) and offers the NMNEC BSN curriculum.

## Requirements for BSN Program Admission

Requirements and procedures to follow for admission to the four-year BSN program are as follows:

1. Obtain admission to NMSU as a regular student.
2. Contact the pre-nursing advisor in the Center for Academic Advising and Student Support for pre-nursing information. Contact the Nursing Advisors at the School of Nursing on application for the program, HESI Admissions Exam, RN-BSN program, 2nd degree students, Military students, and nursing specific questions.
3. Satisfy NMSU basic academic competency requirements in English and Math.
4. Complete prerequisite coursework before final admission to the nursing major. Official transcripts for courses completed elsewhere must be received prior to application.
5. Prerequisite science courses must have been completed within the past seven years.
6. Achieve a grade of C- or better in each nursing prerequisite course.
7. Achieve a competitive minimum prerequisite GPA of 2.75 which includes grades earned from all higher education institutions.
8. Prelicensure applicants to the NMSU School of Nursing are required to take a standardized admission exam and to obtain a satisfactory score prior to application to the nursing major.
9. Applicants will be considered for admission to the nursing major during the fall or spring semester of the anticipated completion of prerequisite coursework or after prerequisite courses are completed. Applicants for fall semester admission may not finish prerequisites in the summer session immediately preceding the fall semester in which they wish to be admitted.
10. Application deadlines each year are:
  - a. February 1st—for consideration for Fall admission to the nursing major
  - b. September 1st—for consideration for Spring admission to the nursing major

NOTE: Admission is competitive and available seats are limited. Priority for admission will be given to applicants with the highest GPAs in the required prerequisite coursework, scores on the standardized admission exam, and to New Mexico residents.

Any applicant not admitted to the nursing major may reapply.

## Second Degree : BSN (Pathway option) or the Accelerated 2nd Degree (Roadrunner option)

Requirements and procedures for admission to the two second degree options are as follows:

1. Obtain admission to NMSU as a second bachelor's degree-seeking student. Applications are considered incomplete if all transcripts are not received by due date.
2. Contact the Nursing advisors at the School of Nursing for advisement on program application and admission.
3. Have a minimum 3.0 GPA on a 4.0 scale in first bachelor's degree
4. Have a minimum of a 3.0 GPA on a 4.0 scale in the required prerequisite Anatomy and Physiology or A&P I and A&P II (8 credits), third science course (3 credits in BIOL, MOLB, CHEM, or PHYS), a Pathophysiology course (3- 4 credits) and Statistics (3 credits). Roadrunner applicants must also obtain a B or better in all prerequisites. All courses must be completed before submitting a nursing application and must not be older than 7 years.
5. Roadrunner students are admitted once a year, in the summer. Pathway option students are admitted in spring or fall semesters. Submit an official application to the second degree option to the School of Nursing by February 1st, for consideration for summer Roadrunner admissions. Submission dates for Pathway students are February 1st for fall admission, or September 1st for spring admission to the nursing program. HESI Admissions Exams must be completed and passed successfully before application to either program.
6. Complete a resume documenting prior education and work experience.
7. A Medical Terminology Course is recommended
8. Applications are considered only after all requested documentation is received by the Nursing Advisors.
9. Three letters of recommendation are required.

## Graduate Program Information

**MSN:** The School of Nursing offers graduate course work for nurses leading to a Master of Science in Nursing (MSN) degree. The MSN specialization offered is Nursing Administration at NMSU. This degree is designed to provide students with the knowledge and experience to assume leadership roles in a variety of health care delivery systems.

The MSN program is accredited by the Commission on Collegiate Nursing Education (CCNE).

Admission to the MSN program is in accordance with the general regulations of the Graduate School. Additional requirements include a BSN from a nationally accredited college or university; successful completion of an inferential statistics course within the last 5 years; three professional letters of recommendation; official transcripts; a letter stating personal goals for graduate education and intended specialty area; resume identifying clinical practice experience; and proof of licensure or eligibility for licensure as a Registered Nurse in any of the 50 United States, the District of Columbia or U.S. territories.

Application for admission should be submitted online through the Graduate School. Letters of reference, personal goals, resume, unofficial transcripts and proof of licensure should be uploaded into the Admissions portal. Applicants who are registered nurses without a bachelor's degree in nursing, but with a bachelor's degree in another discipline may be considered for conditional admission on an individual basis.

**DNP:** The Doctorate in Nursing Practice (DNP) prepares registered nurses to assume advanced nursing practice roles within the health care arena in the areas of the Psychiatric/Mental Health Nurse Practitioner, Family Nurse Practitioner, Adult/Geriatric and Public/Community Health Nursing.

The focus of the DNP is on advanced nursing practice directed towards improving nursing care outcomes for individuals, families, communities, and systems. The program emphasizes culturally sensitive practice, evidenced-based practice, and translation of research to practice as it relates to improving the care of individuals, families, groups and communities experiencing or at risk for health disparities. The complexity of health care combined with rapidly increasing knowledge and the need for both evidence-based practice and translation of research to practice support the scholarship goals of the DNP. For the DNP program, students must also take courses in advanced pathophysiology, advanced assessment, and advanced pharmacology in addition to specialty courses within their area of study. The focus of specific clinical experiences varies with student interest and in consultation with faculty advisors. Students in the DNP program complete a final comprehensive project.

**PhD:** The intent of the nursing PhD program is to prepare individuals who can assume leadership roles in academia, to support scholarship in teaching, research, and professional service activities. The focus of the program is on nursing scholarship that promote the development of new knowledge directed at improving nursing care outcomes for individuals, families, communities and systems. Holistic nursing scholarship as it relates to improving the care of individuals, families, groups and communities experiencing or at risk for health disparities is emphasized. Students in the PhD program complete a dissertation.

Doctoral Admission Criteria: Admission to the PhD and DNP programs is a competitive process and is subject to the general regulations of the Graduate School. Additional requirements include: an MSN from an accredited college or university for the PhD program; a BSN from a nationally accredited program for the BSN to DNP; and an MSN with clinical certification in a nursing specialty area for the MSN to DNP; a graduate level statistics course for both programs (taken within the last five years); official transcripts; three professional letters of recommendation; a letter stating personal goals for graduate education, completion of writing requirement, interview with nursing faculty, resume identifying practice experience; and proof of licensure or eligibility for licensure as a Registered Nurse in any of the 50 United States, the District of Columbia, or U.S. territories. Students in the PhD program complete a Dissertation. Contact the Nursing Graduate Advisor for more information (575) 646-7770.

#### Post-MSN Specialty Certificates

Post-MSN certificates for the specialties of Family Nurse Practitioner and Psychiatric/Mental Health Nurse Practitioner. Contact the Nursing Graduate Advisor for more information (575) 646-7770.

## Degrees for the Department

Nursing - Bachelor of Science in Nursing (p. 652)

Nursing Administration - Master of Science in Nursing (p. 653)

Family Nurse Practitioner - Graduate Certificate (p. 651)

Psychiatric/Mental Health Nurse Practitioner - Graduate Certificate (p. 652)

Nursing Practice - Doctor of Nursing Practice (p. 654)

Nursing - Doctor of Philosophy (p. 653)

**Alexa Doig, Director of the School of Nursing**

**Professors** Doig, Keller; **Associate Professors** Reinhardt, Summers; **Assistant Professors** DeBlicek, Lynch, Noe, Morales, Saiki, Smith, Kuchler

*C. DeBlicek, DNP (U of Minnesota)– nursing informatics and health care technologies; A. Doig, PhD (U of Utah)-pathophysiology, research methods, and oncology; T. Keller, PhD (St. Louis U)– health care policy, health care and nursing administration, professional issues; S. Lynch, PhD (NMSU)– women's health and family counseling; S. Noe, DNP (NMSU)– substance abuse and addictions; A. Reinhardt PhD (OHSU)– administration, leadership, organization, work environments; L. Summers, PhD (UT- Houston)– adolescent health and mental health, telehealth; J. Smith, PhD (UNM)-nursing education, health disparities; M. Morales, PhD (NMSU)- pediatrics, family health; L. Saiki, PhD (UNM)- women's health, research; E. Kuchler, DNP (NMSU)- public, and community health*

## Nursing Courses

### NURS 293. Introduction to Nursing Concepts

#### 3 Credits

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNEC course no.: NMNEC101. Restricted to: BSN,BSNP,BSNR,NURS majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** Admission to Nursing Program.

**Corequisite(s):** NURS 294,NURS 362.

### NURS 294. Principals of Nursing Practice

#### 4 Credits

This course introduces the nursing student to the application of concepts through clinical skills in seminar, laboratory, and/or clinical settings. Principles of communication, assessments, safety, and interventions including accurate calculation, measurement, and administration of medications will be included. Same as NMNEC course no.: NMNEC102. Restricted to: NURS majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** Admission to the nursing program.

**Corequisite(s):** NURS 293,NURS 362.

### NURS 314. Computer Technology for Nurses

#### 3 Credits

Introduction to health care informatics and its use in nursing practice. Focus includes electronic communication resources, issues and technological applications that support nursing and health care.

### NURS 315. Introduction to Professional Nursing for the R. N.

#### 3 Credits

Transition course for the R.N. providing an overview of theories and concepts that are the bases for professional nursing practice.

### NURS 322. Nursing Health Assessment

#### 3 Credits

Theoretical basis for the biopsychosocial assessment of individual patients across the life span for the RN. Restricted to Majors.

### NURS 324. Nursing Care of the Older Adult

#### 3 Credits

Survey course addressing nursing care provisions for the elderly population in a variety of acute, community and home settings.

### NURS 325. Human Pathophysiology for Nursing

#### 3 Credits

Concepts of alteration and adaptation in structure and function of the human body across the life span.

**NURS 326. Pharmacology in Clinical Nursing Practice****4 Credits**

Pharmacological concepts and principles and their implications for nursing practice. Includes techniques of dosage calculation for medication and fluid administration. Restricted to BSN, BSNP, BSNR, NURS majors.

**NURS 328. Human Pathophysiology Foundation for Nursing****4 Credits**

Human pathophysiology concepts of adaptation and alteration in function and structure across the life span and their implications for nursing practice. Restricted to: BSN, BSNP, BSNR majors.

**Prerequisite(s):** Grade of C or better in both BIOL 253 and BIOL 254.

**Corequisite(s):** NURS 362,NURS 293,NURS 294.

**NURS 352. Bioterrorism****3 Credits**

Examines the role of today's nurse in the face of real or potential radiological and chemical threats. Emphasis is placed on clinical and public education and safety as well as nursing/logical responses. Taught online.

**NURS 353. Nursing Informatics****3 Credits**

This course addresses nursing informatics principles and practices. Key concepts include relationship with evidence-based nursing practice, use of decision support systems, clinical information systems, telehealth, and standardized nursing language. Restricted to BSNC majors.

**NURS 360. Introduction to Nursing Concepts****3 Credits**

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNEC course no.: NMNEC101 Restricted to: NURS majors.

**Prerequisite(s):** Admission to Nursing Program.

**Corequisite(s):** NURS 361,NURS 362.

**NURS 362. Evidence Based Practice****3 Credits**

The focus of this course is the principles of evidence based nursing practice. It includes the identification of clinical practice problems, the evaluation of available evidence, and the integration of evidence with clinical expertise and patient preferences in application to practice. Same as NMNEC course no.: NMNEC103. Restricted to: NURS majors.

**Prerequisite(s):** Admission to the nursing program.

**Corequisite(s):** NURS 293,NURS 294.

**NURS 372. Adult Health Nursing I****8 Credits (4+8P)**

Theoretical basis for select acute and chronic illnesses related to adults is provided, and critical thinking is used to plan nursing care. Includes clinical component.

**NURS 373. Nursing the Psychiatric-Mental Health Client****5 Credits (3+4P)**

Theoretical and practical knowledge applied to provision of psychiatric-mental health nursing service across the health care continuum. Includes clinical component. Restricted to BSN, BSNR, BSNP, NURS majors.

**NURS 375. Introduction to Nursing Research****3 Credits**

Introduction to scientific inquiry. Evaluation and utilization of nursing research for clinical practice.

**Prerequisite(s):** (STAT/A ST 251G, A ST 311, OR STAT 271G) and (NURS 303, NURS 326, and NURS 328) or consent of instructor.Restricted to BSN, BSNP, BSNR, NURS majors.

**NURS 376. Research and Evidence-Based Practice for the Practicing RN**  
**3 Credits**

Course provides introduction to evidenced-based practice and research principles for the practicing RN. Evidence-based practice principles and processes are covered. Foundations of research (quantitative and qualitative) research designs and research evaluation are included. Emphasis is placed on ethical and practical issues in critiquing and using research/evidence-based findings. Restricted to BSNC majors.

**Prerequisite(s):** A ST 311, or admission to RN-BSN Option with consent of instructor.

**NURS 377. Health and Illness Concepts I****3 Credits**

This course will focus on health and illness concepts across the lifespan. Concepts covered are related to homeostasis/regulation, sexuality/reproductive, protection/movement and emotional processes. Same as NMNEC course no.: NMNEC201 Restricted to: NURS majors.

**Prerequisite(s):** NURS 294, NURS 293 & NURS 362.

**Corequisite(s):** NURS 378,NURS 379,NURS 380.

**NURS 378. Health Care Participant****3 Credits**

This course introduces the nursing student to the attributes of the health care participant as an individual, a family, or a community. Same as NMNEC course no.: NMNEC202. Restricted to: NURS majors.

**Prerequisite(s):** NURS 293, NURS 294 & NURS 362.

**Corequisite(s):** NURS 377,NURS 379,NURS 380.

**NURS 379. Nursing Pharmacology****3 Credits**

This course introduces the nursing student to pharmacologic nursing practice from a conceptual approach. Same as NMNEC course no.: NMNEC203. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** BIO 253 & BIO 254 OR SPM 271 & SPM 371 OR BIO 225 & Bio 226.

**Corequisite(s):** NURS 328.

**NURS 380. Assessment and Health Promotion****4 Credits**

This course introduces the nursing student to the assessment of and the health promotion for the health care participant as an individual, a family, or a community. This course uses seminar, laboratory and/or clinical settings. Same as NMNEC course no.: NMNEC204. Restricted to: NURS majors.

**Prerequisite(s):** NURS 293, NURS 294, NURS 362.

**Corequisite(s):** NURS 377,NURS 378,NURS 379.

**NURS 395. Health and Illness Concepts II****3 Credits**

This course will cover health and illness concepts across the lifespan. Concepts covered are related to oxygenation and hemostasis, homeostasis and regulation, protection and movement, and cognitive and behavioral processes. Same as NMNEC course no.: NMNEC301. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 328, NURS 377, NURS 378, NURS 379, NURS 380.

**Corequisite(s):** NURS 396,NURS 398.

**NURS 396. Professional Nursing Concepts I****3 Credits**

This course covers foundational concepts for professional development, including selected professional attributes and care competencies. Same as NMNEC course no.: NMNEC302. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 328, NURS 377, NURS 378, NURS 379, NURS 380.

**NURS 397. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for at total of 21 credits.

**NURS 398. Care of Patients with Chronic Conditions****4 Credits**

The focus of this course is to provide safe, evidence-based nursing care for patients with chronic conditions, across the lifespan in a variety of settings. This course builds upon curricular concepts. This course is a combination of lab and clinical. Same as NMNEC course no.: NMNEC303. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 328, NURS 377, NURS 378, NURS 379, NURS 380.

**Corequisite(s):** NURS 395,NURS 396.

**NURS 410. Adult Health Nursing II****6 Credits (3+6P)**

Focus is on the use of critical thinking to plan nursing care of adults with selected complex illnesses. Clinical component included.

**NURS 415. Parent-Child Nursing****8 Credits (4+8P)**

Concepts and principles of nursing applied to healthy and ill infants, children, adolescents, and childbearing women within the context of the family. Includes clinical component.

**NURS 416. Older Adult Nursing****2 Credits**

Introduction to aging, health problems and issues associated with aging. Implications for nursing care of the elderly.

**NURS 420. Community Health Nursing****3 Credits**

Concepts basic to the nursing care of families, groups, and communities with an emphasis on health promotion, disease prevention, and health maintenance.

**NURS 426. Community Health Nursing for the R.N.: Clinical****3 Credits**

Nursing process applied to the care of families, groups, and communities.

**NURS 460. Strategies for Student Success****3 Credits**

This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors.

**NURS 466. Health and Illness Concepts III****4 Credits**

This course will cover health and illness concepts across the lifespan. Concepts covered are related to hemostasis/regulation, oxygenation/homeostasis, protection/movement, and emotional processes. Same as NMNEC course no.: NMNEC401. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 360, NURS 361, NURS 362.

**Corequisite(s):** NURS 467,NURS 468.

**NURS 467. Clinical Intensive I****4 Credits**

This is the first of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. This course is a combination of seminar, lab, and clinical. Same as NMNEC course no.: NMNEC402.

Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 395, NURS 396, NURS 398.

**Corequisite(s):** NURS 466,NURS 468.

**NURS 468. Clinical Intensive II****4 Credits**

This is the second of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. This course is a combination of seminar, lab, and clinical. Same as NMNEC course no.: NMNEC404.

Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 395, NURS 396, NURS 398.

**Corequisite(s):** NURS 466,NURS 467.

**NURS 470. Nursing Organization and Management****3 Credits**

Concepts of organization and delivery of care to groups of patients based on the nursing process. Emphasis on the roles of the nurse as manager, leader, and change agent within health-care organizations.

**NURS 472. Community and Population Focused Nursing****6 Credits (3+6P)**

Synthesis of nursing, social, and public health science to develop health promotion, disease prevention, and protection strategies for communities and populations. Clinical component included.

**NURS 475. Issues and Trends in Professional Nursing****3 Credits**

Explores the challenges associated with issues and trends in health care and the legal and ethical implications of professional nursing practice.

**NURS 476. Nursing Organization & Management for the R.N.: Clinical****3 Credits**

Nursing process applied to organization, management, and delivery of health care. An integrating experience for the R.N. student designed to facilitate the transition to professional practice. Students work with mentors in a clinical setting to develop professional nursing roles related to leadership and management.

**NURS 477. Nursing Organization and Management for the RN****3 Credits**

Course covers nursing organization, leadership, and management principles, theories, and research for the practicing RN. Restricted to BSNC majors.

**NURS 479. Nursing Care for Complex Patients****8 Credits (2+12P)**

Principles and priorities of nursing care for patients across the life span experiencing complex care problems. Includes integrating experiences designed to facilitate the transition from student to professional nurse. Includes clinical component.

**NURS 486. Concept Synthesis****3 Credits**

This course will focus on the synthesis of curricular concepts in the care of complex patients. Same as NMNEC course no.: NMNEC501. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 466, NURS 467, NURS 468.

**Corequisite(s):** NURS 487,NURS 488,NURS 489.

**NURS 487. Professional Nursing Concepts II****3 Credits**

This course covers policy concepts for professional nursing. Same as NMNEC course no.: NMNEC502. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 466, NURS 467, NURS 468.

**NURS 488. Clinical Intensive III****4 Credits**

The focus of this clinical course is application of the curricular concepts in the management of care participants with complex conditions across the lifespan. This course is a combination of seminar, lab, and clinical. Same as NMNEC course no.: NMNEC503. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 466, NURS 467, NURS 468.

**Corequisite(s):** NURS 486,NURS 487,NURS 489.

**NURS 489. Capstone****4 Credits**

The synthesis, integration, and application of concepts to professional nursing practice will be applied in the final clinical course to ensure readiness to enter practice. Same as NMNEC course no.: NMNEC504. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** Successful completion of all previous nursing courses.

**Corequisite(s):** NURS 486,NURS 487,NURS 488.

**NURS 490. Independent Study****1-3 Credits**

Individual studies with prior approval of department head.

**NURS 500. Applied Statistics for Evidence-Based Practice****3 Credits**

Provides the logic and appropriate use of statistical techniques most commonly used. Emphasis is based on underlying logic of procedure, the appropriate use of underlying assumptions of procedures, interpretation of results from statistical software and evaluation of published results of the procedures. Statistical software will be used. Restricted to: NURP majors.

**Prerequisite(s):** Admission to DNP Program.

**NURS 505. Theoretical Foundations of Advanced Nursing****3 Credits**

This course is a graduate-level introduction to nursing theory. This course assists students in understanding the nature of theory development in nursing, evidence-based practice and related disciplines. Students examine the definitions and meanings of the basic concepts of theory along with theory development and will explore an analysis of selected theories/models and their application to nursing practice, research, education, and administration.

**Prerequisite(s)/Corequisite(s):** Students must be enrolled in the graduate program in nursing or have the permission of advisor and faculty of course to enroll in course. Restricted to: NURS majors.

**NURS 506. Health Policy for Advanced Nursing Practice****3 Credits**

Course provides a conceptual approach to understanding health policy including the social, legal, political and ethical factors that influence policy development. Strategies for influencing policy direction and change are examined. Restricted to: NURS, NUSC, NURP majors.

**NURS 507. Nursing Research in Evidence-Based Practice****3 Credits**

This course is designed to prepare advanced practice nurses with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice.

**Prerequisite(s)/Corequisite(s):** Students must be enrolled in the graduate program in nursing or have the permission of advisor and faculty to enroll in the course. Restricted to: NURS, NUSC, NURP majors.

**NURS 511. Advanced Pathophysiology for Clinical Nursing****3 Credits**

In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice. Restricted to: NURS, NUSC, NURP majors.

**NURS 512. Advanced Clinical Pharmacology****3 Credits**

Principles of clinical pharmacology for advanced clinical practice. Focus on pharmacology as it relates to human physiology and pathophysiology across the lifespan. Restricted to: NURS, NUSC, NURP majors.

**NURS 514. Psychopharmacology for Advanced Practice****3 Credits**

Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education.

**NURS 515. Advanced Health Assessment****3 Credits (2+1P)**

Assessment theory and skills for advanced clinical practice. Emphasis on assessment of patients across the life span. May be repeated up to 3 credits. Restricted to: NURS,NUSC,NURP majors.

**NURS 518. Genetics and Health****2 Credits**

Assess the impact of emerging genetic technologies on healthcare at the individual, system and population level. Restricted to DNP majors.

**Prerequisite(s):** Admission to DNP Program.

**NURS 530. Promoting Health Behavior****3 Credits**

Emphasis is on the role of the advanced practice nurse in facilitating health behavior change. The impact of health status on health behavior, ethical issues relate to health promotion, and the processes for promoting healthy behaviors are explored. Theoretical models of behavior change and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change.

**NURS 540. Advanced Psychosocial Pathology for Family, Psychiatric-Mental Health Nursing****3 Credits**

In-depth study of psychosocial pathology, factors contributing to psychosocial dysfunction, and diagnostic reasoning basic to advanced-practice psychiatric mental health nursing; emphasis on etiology and differential diagnoses. Restricted to: NURS majors.

**Prerequisite(s):** Admission to the DNP Program.

**NURS 562. Innovations and Health Care Organizations****3 Credits**

Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Taught with NURS 649.

Restricted to: NURS, NUSC, NURP majors.

**NURS 563. Human Resource Management in Nursing****3 Credits**

Contemporary approaches to the development and management of nursing resources that complement organizational vision, strategies and management goals. Management of a diverse, quality workforce that results in an improved organizational performance. Performance evaluation, motivation, professional development and legal and regulatory aspects will be explored.

**NURS 564. Nursing Fiscal Management****3 Credits**

Concepts of financial management emphasizing principles of health care budgeting and finance in managing health care resources. A focus is to achieve quality outcomes through financial resource management. May be repeated up to 3 credits. Restricted to: NURS majors.

**NURS 565. Advanced Leadership in Healthcare****3-5 Credits (3+1-2P)**

Analysis of leadership theories as they pertain to the nurse executive and the advanced practice nurse in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Clinical component included for DNP students only. May be repeated up to 5 credits. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** NURS 562.

**NURS 566. Seminar in Nursing Administration- Roles****3 Credits**

Role preparation for the nurse administrator as manager, leader, collaborator and change agent. Synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration.

**Corequisite:** NURS 595.

**NURS 567. Nursing Informatics****3 Credits**

This course provides the foundational knowledge necessary to integrate systems and information technologies. Topics include informatics, knowledge management, healthcare information systems/telehealth including the electronic health record. Focuses on using available technology to enhance safety and monitor the health status and outcomes of populations. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** Consent of Instructor.

**NURS 572. Pharmacology of Addictions****4 Credits**

Concepts and principles of the pharmacology of psychoactive substances and the addiction process; including the pharmacological approach to treatment. Restricted to: NURS majors.

**NURS 574. Oncology Nursing****3 Credits**

This course presents the clinical aspects of cancer diagnosis, the clinical management of major cancers, and their treatment modalities. The course will also focus on supportive therapies for the cancer patient and symptom management.

**Prerequisite(s):** Graduate status or permission of instructor.

**NURS 590. Independent Study****1-10 Credits**

Individual studies and directed research with prior approval of department head. May be repeated on a different topic. May be repeated for a maximum of 20 credits.

**Prerequisite:** consent of instructor.

**NURS 595. Advanced Field Work in Nursing****3 Credits**

Faculty-supervised, independent work in student's advanced practice role. Field work normally taken after the core and designated specialty courses. Minimum of three field-work credits (12 contact hours) required in major area of study. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits. Restricted to: NURS majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** NURS 565.

**Corequisite(s):** NURS 566.

**NURS 597. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a different subject area. May be repeated for a maximum of 8 credits.

**Prerequisite:** consent of instructor.

**NURS 600. Philosophy of Science in Nursing****3 Credits**

Offers a framework for asking both ontological and epistemological questions about knowledge, human science, and nursing science.

**NURS 601. Theory I: Methods and Processes of Nursing Knowledge****Development****3 Credits**

Building on the Philosophy of Science course, the student will engage in analysis and critique of both developmental processes and composition of nursing disciplinary knowledge. Diverse approaches will be used to appraise and critique historical and contemporary milestones in the development and evaluation of nursing thought. Emphasis is also placed on implications of theory and knowledge development as related to multicultural and rural issues.

**Prerequisite(s):** NURS 600.

**NURS 602. Theory II: Contemporary Substantive Nursing Knowledge****3 Credits**

Critically examine existing & evolving substantive knowledge drawn from nursing and other disciplines. Focus on the construction, analysis of current substantive nursing knowledge, including evaluation of relationships among theories, evidence and explanation will be pursued. Special attention to existing and evolving theories applicable to rural, multicultural and educational settings. Prerequisite: NURS 601

**NURS 606. Quantitative Methods in Nursing Research****3 Credits**

Focus on approaches to developing nursing knowledge by means of quantitative research methods as applied to clinical problems, theoretical modeling of human responses to health and illness, and health policy issues. Emphasizes detailed analysis and critique of non-experimental and experimental designs, issues pertaining to sampling and statistical power, the reliability and validity of measures, and uses and abuses of descriptive and inferential statistics in nursing research literature. Students are expected to develop sufficient discernment to read, critique, evaluate, and discuss the quality, significance, and limitations of published quantitative nursing research.

**Prerequisite:** NURS 621.

**NURS 607. Qualitative Methods in Nursing Research****3 Credits**

Major methodological traditions of qualitative research and their applications to knowledge development and clinical research in nursing are the emphasis. Overview of at least one computer-assisted qualitative data analysis software application. Students will engage in detailed critique and discussion of significant nursing investigation representing various qualitative approaches and traditions.

**NURS 610. Nursing Education: Pedagogy and Roles****3 Credits**

Teaching-learning process in the clinical and classroom settings. Focuses on educational patterns and pathways in nursing and the roles of faculty in academia. Educational reform is analyzed in relationship to diversity in students, faculty, practice settings and technology-driven learning environments. Instructional designs, teaching strategies, and outcome evaluations are examined for their pedagogic use. The development of critical thinking outcomes, mentorships and partnerships to meet the needs of students are addressed. The course examines issues and challenges that impact the educational process such as student and faculty recruitment, the changing healthcare environment, differentiation of practice, advanced practice, reduced resources and links with theory and research.

**NURS 620. Advanced Health Care Statistics I****3 Credits**

This course provides knowledge, skills and practice in collecting, analyzing and interpreting data. The following quantitative techniques will be examined and utilized using SPSS: principle of measurement, probability, principles of parametric and non parametric techniques, Kolmogorov-Smirnov test, comparison of means, correlation analyses, use of psychometric techniques, binomial test, sign test, McNemar test, median test, Cochran Q test, Phi coefficient, Fisher's Exact test, Mann-Whitney U, Kruskal-Wallis test, Wilcoxon Signed Ranks and Spearman Rho. A graduate level statistics course completed within three years prior to the date of expected admission is desirable. Restricted to majors

**NURS 621. Advanced Health Care Statistics II****3 Credits**

This course is the second of a two-semester quantitative statistical course designed to provide knowledge, skills and practice in collecting, analyzing, and interpreting data. The following quantities techniques will be examined and utilized using SPSS: analysis of variance (ANOVA), analysis of covariance(ANCOVA), linear, multiple, and logistic regression, structural equation modeling (SEM), principle components analysis, and factor analysis. Restricted to majors.

**Prerequisite:** NURS 620.

**NURS 623. Mixed Methods****3 Credits**

Presents a brief overview of research paradigms with emphasis on formulating research questions, aims and methods for a mixed method/model approach. Students may use proposals developed in earlier qualitative and quantitative research classes to devise mixed method proposal integrating readings on these methods and own research interests. **Prerequisite:** NURS 606 and NURS 607

**NURS 624. Measurement in Culturally Diverse Border Populations****3 Credits**

The focus of this course is the development of essential competencies required to locate, select, evaluate, and use instruments to operationalize nursing variables. Ethical considerations in nursing research and research issues in diverse populations will be discussed. Specific attention is given to the process of moving from concept to construct, measurement theory, validity/reliability issues, and measurement issues in diverse populations including literacy, social desirability bias, sensitive data, translations, and cultural equivalency. Restricted to PhD in Nursing majors.

**Prerequisite(s):** Admission to PhD in Nursing program; NURS 606; NURS 623; or consent of Instructor.

**NURS 630. Issues in Studying Health of Culturally Diverse and Border Populations****3 Credits**

Analysis and evaluation of the unique health care needs of culturally diverse and rural populations across the lifespan from ethnic, economic, gender, and sexual orientation perspectives. Interdisciplinary strategies to affect positive health outcomes are discussed, analyzed, and evaluated. Restricted to: NURS, NUSC, NURP majors.

**NURS 631. Population Based Approaches to Health Promotion****3 Credits**

Population based approaches to health promotion focuses on preparing nursing students to identify, critically analyze and evaluate health promotion initiatives in culturally diverse and border populations using the Southwestern U.S. and U.S./Mexico border as the case exemplar. It examines historical, socio-economic, legal and professional issues associated with health promotion and policy initiatives. It considers prospects for social change, political movements and alternative approaches to develop and hasten adaption of health promotion initiatives in partnership with communities, advocacy groups and health care agencies.

**NURS 649. Innovations and Health Care Organizations****3 Credits**

Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Taught with NURS 562.

Restricted to: NURS, NUSC, NURP majors.

**NURS 650. Behavioral Approaches and Determinants of Nursing and Health****3 Credits**

Focuses on how behavioral/mental health concepts are applied in determining health outcomes for individuals, families, and communities. Students will apply and synthesize theoretical constructs within practice and research focusing on behavioral/mental health concepts. Health outcomes are viewed in a traditionally holistic manner in that health outcomes are discussed as an integral part of the human experience of healing and health.

**NURS 651. Applied Nursing Science for the APN****3 Credits**

Explores the philosophical and scientific underpinnings for nursing knowledge relevant to the role of the doctorate of nursing practice.

Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** NURS 507.

**NURS 652. Translational Methods and Evidence-Based Practice****3 Credits**

Designed to prepare DNP student to demonstrate advanced levels of clinical judgment, systems thinking, and accountability in design, delivery, and evaluating evidence based on care to improve patient outcomes. Translate evidence into their specialty practice environment. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** NURS 651.

**NURS 658. The Aging Adult****3 Credits**

This course focuses on the care and management of older adults and their families. Content is directed at assessment and management of acute and chronic presentations of illness and complex, multiple health problems across the health care continuum. It will include examination of the psycho-socio-cultural processes which influence the behavioral patterns, coping, and adaptation of older adults. Restricted to DNP majors.

**Prerequisite(s):** Admission to DNP program.

**NURS 659. Addictive Disorders****4 Credits**

Focus on care of the individual with addictive disorders. The impact on the individual as well as the community will be examined. Advanced practice nursing interventions based on theoretical and research based knowledge of addictions will be addressed. The pharmacology of psychoactive substances, the addiction process, and pharmacological approach to treatment will be included. Treatment of addictive disorders and their relevance to culturally diverse clientele with a variety of lifestyles will be evaluated. Restricted to: NURP majors.

**Prerequisite(s):** Admission to DNP program.

**NURS 660. Family, Psychiatric Mental Health Nursing I****6 Credits (3+1-3P)**

This course provides the family psychiatric nurse practitioner student with advanced theoretical knowledge and practice in individual therapies, comprehensive psychiatric evaluation, personality development concepts, dual diagnoses and psychotherapy principles; including management of health promotion, health maintenance and disease prevention activities. Emphasis will be placed on individuals across the lifespan in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 6 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 511, NURS 512, NURS 515.

**NURS 662. Family, Psychiatric-Mental Health Nursing II****5-7 Credits (3+2-4P)**

This course provides further knowledge and skills for the family psychiatric nurse practitioner student in the conceptual framework and practice of psychotherapy in a variety of settings. Emphasis is placed on work with individuals and families and groups across the lifespan in a multicultural environment to help manage their acute and chronic mental illnesses, including, dual diagnosis, psychopathology and psychopharmacology. Advanced practice nurses in the certificate program will have varying hours of credit. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 7 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 660.

**NURS 664. Family, Psychiatric Mental Health Nursing III****5 Credits (1+3-4P)**

This course provides further knowledge and skills for the family psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment. Emphasis will be placed on individuals, families and groups across the lifespan in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 5 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 662.

**NURS 670. Diagnostic Reasoning****3 Credits (2+4P)**

This course is designed to develop advanced knowledge of differential diagnosis based upon physical and mental assessment of clients/patients across the lifespan in a variety of clinical settings. Students apply, synthesize, and integrate advanced clinical problem solving and reasoning to determine differential nursing and medical diagnoses, interpret and apply laboratory and diagnostic techniques to determine a final judgment and diagnosis. Restricted to DNP majors.

**NURS 671. Primary Care I****6 Credits (3+1-3P)**

This course provides the nurse practitioner student with advanced theoretical knowledge and practice in the assessment and management of health promotion, health maintenance and disease prevention activities across the lifespan; including the assessment and management of common acute and chronic health concerns. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 6 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 511, NURS 512, NURS 515.

**NURS 672. Primary Care II****5-7 Credits (3+2-4P)**

The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common (variable clinical credit for certificate program students)chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. Advanced practice nurses in the certificate program will have varying hours of credit. May be repeated up to 7 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 671.

**NURS 673. Primary Care III****5 Credits (1+3-4P)**

The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common acute and chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 5 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 672.

**NURS 676. Women's Health****3 Credits**

The course will examine patient and family perspectives as well as health care system variables and societal issues that affect the organization and delivery of women's health care. Students will engage in critical analysis of the evidence base concerning psychosocial and spiritual concerns and barriers to and opportunities for improving women's health care across the diverse settings in which health care is delivered. Focus on evidence-based approaches to the primary care management of women. May be repeated up to 3 credits.

**NURS 678. Health Needs of Special Populations****2-4 Credits (2+1-2P)**

This course provides an overview of infant, child, adult and older adult health needs and interventions that promote and support optimal health. The conceptual and theoretical foundation for advanced practice with individuals and families across the lifespan is emphasized, including pharmaco-therapeutic and integrated bio-psychosocial interventions for diverse populations across the continuum of care. Advanced practice nurses in the certificate program will have varying hours of credit. May be repeated up to 4 credits.

**Prerequisite(s):** NURS 671, NURS 672, NURS 673, NURS 660, NURS 662, NURS 664.

**NURS 684. Lifestyle Change and Adherence Issues with Diverse Populations****3 Credits**

Includes the critical examination of selected theories of health behavior on life style choices and adherence issues with diverse populations within the community setting. Emphasis is given to the analysis of health behavior in regard to planning, development, and evaluation of population based health programs. Restricted to DNP majors.

**NURS 685. Epidemiology for Advanced Nursing Practice****2 Credits**

Emphasis is on the practical application of the principles of epidemiology in the measurement and evaluation of population health. Epidemiological literature will be critiqued and synthesized to evaluate population-based public health nursing problems. Issues related to disease surveillance, causation, genetic patterns, screening and social trends in population health will be examined. Use of existing data bases and technology programs are covered. Restricted to: NURP, NURS, NUSC majors.

**NURS 690. Doctoral Nursing Seminar****1-3 Credits (1-3)**

Seminar to build nursing scholarship skills, consisting of a series of 1 credit seminars that are taken as part of the doctoral degree plan. May be repeated up to 7 credits. Restricted to: NUSC majors.

**NURS 691. Independent Study****1-6 Credits (1-6)**

Individual studies and directed research with prior approval of department head. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**NURS 697. Professional Roles for Advanced Practice Clinical Nursing****3 Credits**

This course will focus on providing an in depth understanding of the legal, historical, political, social, and ethical aspects of advanced practice nursing. Traditional and emerging roles for advanced practice nursing are examined. Restricted to DNP majors.

**Prerequisite(s):** Admission to DNP program, NURS 664 OR NURS 672.

**NURS 698. Advanced Practice Nursing Immersion****1-4 Credits (1-4)**

Practicum experience for advanced practice students. Focus will be on a practice issue chosen by the student for further development as an evidence-based doctoral project. Clinical practice hours as needed to meet DNP requirements. Up to 24 credits may be completed by student. May be repeated up to 4 credits. Restricted to: NURP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** NURS 511, NURS 512, NURS 515 or enrollment in post-masters track.

**NURS 699. Clinical Scholarly Project****1-4 Credits (1-4)**

Building on the practice expertise of the DNP student, this series of credits is to provide the student with the opportunity to design an innovative clinical practice improvement project/program addressing an actual health care concern. Through mentored activities, the DNP student will identify, develop, implement, evaluate, and disseminate an independent analytic. Graded: S/U. NURS 652. Restricted to: NURP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Admission to DNP program.

**NURS 700. Doctoral Dissertation****1-9 Credits (1-9)**

Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits.

**Office Location:** College of Health and Social Services Room 102, 1st floor

**Phone:** (575) 646-3812

**Website:** <http://schoolofnursing.nmsu.edu/>

## Family Nurse Practitioner - Graduate Certificate

**Post-Master's Certificate Program:** This program is for those Master's-Prepared Advanced practice nurses (Nurse practitioners) who hold current "certification" in a clinical specialty area who wish to obtain the coursework needed to sit for certification in another area. The SON currently offers a post-MSN certificate in Family Psych/Mental Health Practitioner and Family Nurse Practitioner.

The Post-Master's certificate consists of 18 credit hours which includes a minimum of 500 clinical hours. When applying to the Post-Master's Certificate program, please select "Graduate Certificate" in the application system. Please note that the clinical hours are "required" for national certification and cannot be waived or negotiated.

**The Family Nurse Practitioner** track prepares nurses for advanced practice through a course of study focused on the health care of families across the lifespan. The courses in this specialty focus on advanced health assessment, advanced pathophysiology, advanced pharmacology, and management of acute and chronic illness in families. These courses are combined with specialty seminars and clinical experiences that emphasize the physiological and psychosocial impact of illness on the patient and family. Graduates are prepared to sit for the Family Nurse Practitioner certification exam.

## Psychiatric/Mental Health Nurse Practitioner - Graduate Certificate

**Post-Master's Certificate Program:** This program is for those Master's-Prepared Advanced practice nurses (Nurse practitioners) who hold current "certification" in a clinical specialty area who wish to obtain the coursework needed to sit for certification in another area. The SON currently offers a post-MSN certificate in Psych/Mental Health Practitioner and Family Nurse Practitioner.

The Post-Master's certificate consists of 18 credit hours which includes a minimum of 500 clinical hours. When applying to the Post-Master's Certificate program, please select "Graduate Certificate" in the application system. Please note that the clinical hours are "required" for national certification and cannot be waived or negotiated.

**The Psych/Mental Health Specialty** prepares nurses for advanced practice with a focus on mental health issues across the lifespan. The curriculum builds upon four core PMHNP competencies: advanced health assessment (physical and psychosocial); diagnosis (diagnosis of mental disorders, pathophysiology, and neurophysiology); psychotherapy (individual, group, and family); and medication management (pharmacology and psychopharmacology). Other courses develop competencies in health care systems, best-practice research utilization and translation, and health care quality improvement. Graduates are prepared to sit for the Psych/Mental Health Nurse Practitioner Exam.

## Nursing - Bachelor of Science in Nursing

### Four-Year Curriculum Plan Courses

A grade of C- or better is required for all courses in the curriculum. Students must also complete six elective credits from the Part III Viewing a Wider World general education category.

Math basic academic skills requirement must be satisfied.

#### Departmental Requirements

A ST 311 or STAT 251G	Statistical Applications Statistics for Business and the Behavioral Sciences	3
BIOL 211G or BIOL 377	Cellular and Organismal Biology Cell Biology	3
BIOL 211GL	Cellular and Organismal Biology Laboratory	1
BIOL 219 or BIOL 311 or BIOL 221	Public Health Microbiology General Microbiology Introductory Microbiology	3
BIOL 311 L or BIOL 221 L	General Microbiology Laboratory Introductory Microbiology Laboratory	2
BIOL 253 or BIOL 225 or BIOL 353 or SP M 271	Human Anatomy Human Anatomy and Physiology I Pre-Professional Human Anatomy Anatomy & Physiology I	4
BIOL 254 or BIOL 226 or BIOL 354 or SP M 371	Human Physiology Human Anatomy and Physiology II Physiology of Humans Anatomy and Physiology II	3

C EP 110G or PSY 350 or PSY 351	Human Growth and Behavior Developmental Psychology: Conception through Childhood Developmental Psychology: Adolescence through Old Age	3
HNDS 251	Human Nutrition	3
MATH 121G or MATH 142G or MATH 190G or MATH 191G or MATH 192G	College Algebra Calculus for the Biological and Management Sciences Trigonometry and Precalculus Calculus and Analytic Geometry I Calculus and Analytic Geometry II	3
PSY 201G	Introduction to Psychology	3
Select one from the following:		4
CHEM 110G or CHEM 115	Principles and Applications of Chemistry Principles of Chemistry I	
CHEM 111G	General Chemistry I	
CHEM 112G	General Chemistry II	

#### Common Core

Communications Area I
Math Area II (counted in department)
Science Area III (counted in department)
Social/Behavior Science Area IV (3 credits counted in department)
Humanities Area V

#### University Requirements

Select 6 credits from VWV (from specified list)	6
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#### Nursing Courses <sup>1</sup>

<i>Level 1</i>		
NURS 293	Introduction to Nursing Concepts	
NURS 294	Principals of Nursing Practice	
NURS 328 or BIOL 227 or BIOL 262 & BIOL 263	Human Pathophysiology Foundation for Nursing Pathophysiology Human Pathophysiology I and Pathophysiology II	
NURS 362	Evidence Based Practice	
<i>Level 2</i>		
NURS 377	Health and Illness Concepts I	
NURS 378	Health Care Participant	
NURS 379	Nursing Pharmacology	
NURS 380	Assessment and Health Promotion	
<i>Level 3</i>		
NURS 395	Health and Illness Concepts II	
NURS 396	Professional Nursing Concepts I	
NURS 398	Care of Patients with Chronic Conditions	
<i>Level 4</i>		
NURS 466	Health and Illness Concepts III	
NURS 467	Clinical Intensive I	
NURS 468	Clinical Intensive II	
<i>Level 5</i>		
NURS 486	Concept Synthesis	
NURS 487	Professional Nursing Concepts II	

NURS 488	Clinical Intensive III	
NURS 489	Capstone	
Total Credits		41

<sup>1</sup> **Formal Acceptance required before taking NURSING courses.** The NMSU School of Nursing participates in the New Mexico Nursing Education Consortium. The nursing curriculum offered is the NMNEC Statewide Curriculum Plan.

*Note: A grade of C- or better is required for all courses in the curriculum. You must also complete 6 elective credits from the Part III Viewing a Wider World general education category.*

1. An applicant who is not a U.S. citizen or who has been convicted of a felony is advised to contact the appropriate State Board of Nursing regarding eligibility for licensure.
2. Clinical clearances are required for all students prior to admission and concurrent with each semester of studies. These include: current immunizations; background screening; drug testing; individual health insurance coverage; current CPR status; various health agency orientations, as well as other requirements mandated by clinical affiliation agreements. Failure to complete and provide documentation within timelines established by the School of Nursing may prevent admission to/or continuation within the nursing program.
3. Students are required to make a satisfactory score on nationally-normed, standardized tests before application. In the last semester of the curriculum, students are required to take a comprehensive/standardized exam and to make a satisfactory score on this exam prior to their final clinical experience.
4. Newly admitted students are required to attend an orientation session which occurs prior to the start of classes for their first nursing semester.
5. School-wide activities begin 1-3 days prior to the start of classes. Attendance is required.

## Nursing - Doctor of Philosophy

**Ph.D.:** The intent of the nursing Ph.D. program is to prepare individuals who can assume leadership roles in advancing the scholarship of teaching, research and professional service activities. The focus of the program is on nursing scholarship to facilitate development of new knowledge and nursing education directed at improving nursing care outcomes for individuals, families, communities and systems.

Admission to the Ph.D. and DNP programs is in accordance with the general regulations of the Graduate School. Additional requirements include:

- a MSN from an accredited college or university;
- successful completion of an upper division statistics course for the DNP program and a graduate level statistics course for the Ph.D. program (taken within the last five years);
- three professional letters of recommendation;
- a letter stating personal goals for graduate education, completions of writing requirement, interview with nursing faculty, resume identifying practice experience; and
- proof of licensure or eligibility for licensure as a Registered Nurse in any of the 50 United States, the District of Columbia, or U.S. territories.

Students in the Ph.D. program complete a Dissertation. All materials should be sent to the School of Nursing with Graduate School application materials placed in a separate envelope. Contact the Ph.D. programs for full and part-time options.

### Required Courses

NURS 600	Philosophy of Science in Nursing	3
NURS 601	Theory I: Methods and Processes of Nursing Knowledge Development	3
NURS 602	Theory II: Contemporary Substantive Nursing Knowledge	3
NURS 606	Quantitative Methods in Nursing Research	3
NURS 607	Qualitative Methods in Nursing Research	3
NURS 610	Nursing Education: Pedagogy and Roles	3
NURS 620	Advanced Health Care Statistics I	3
NURS 621	Advanced Health Care Statistics II	3
NURS 623	Mixed Methods	3
NURS 624	Measurement in Culturally Diverse Border Populations	3
NURS 630	Issues in Studying Health of Culturally Diverse and Border Populations	3
NURS 631	Population Based Approaches to Health Promotion	3
NURS 650	Behaviorial Approaches and Determinants of Nursing and Health	3
NURS 690	Doctoral Nursing Seminar	1-3
NURS 700	Doctoral Dissertation	21
Electives		9
Total Credits		70-72

Those enrolled as PhD students have dissertation and non-dissertation options (check with advisor). All students must complete a written and oral examination after completing 41-47 credit hours.

New Mexico State University is a full member of the National Council of State Authorization Reciprocity Agreements consortium (SARA). Students will need to check the SARA website (<http://nc-sara.org/>) before application to determine if NMSU has a reciprocity agreement with their home state before application is made.

## Nursing Administration - Master of Science in Nursing

**MSN:** The School of Nursing offers graduate course work for nurses leading to a Master of Science in Nursing (MSN) degree with a concentration in Nursing Administration. This concentration is designed to provide students with the knowledge and preparation to assume leadership roles in a variety of health care delivery systems. The program is accredited by the Commission on Collegiate Nursing Education (CCNE).

Admission to the MSN program is in accordance with the general regulations of the Graduate School. Additional requirements include:

- a BSN from a nationally accredited college or university;
- successful completion of an inferential statistics course within the last 5 years;
- three professional letters of recommendation;

- official transcripts;
- a letter stating personal goals for graduate education and intended specialty area;
- resume identifying clinical practice experience; and
- proof of licensure or eligibility for licensure as a Registered Nurse in any of the 50 United States, the District of Columbia or U.S. territories;
- a personal interview with Graduate Nursing Faculty is required.

For admission information, contact the NMSU Office of Admissions, <http://prospective.nmsu.edu/>.

## Concentration: Nursing Administration

The MSN course of study leading to the master's degree in Nursing Administration follows

### MSN: Administration

NURS 505	Theoretical Foundations of Advanced Nursing	3
NURS 506	Health Policy for Advanced Nursing Practice	3
NURS 507	Nursing Research in Evidence-Based Practice	3
NURS 530	Promoting Health Behavior	3
NURS 563	Human Resource Management in Nursing	3
NURS 564	Nursing Fiscal Management	3
NURS 565	Advanced Leadership in Healthcare	3-5
NURS 566	Seminar in Nursing Administration- Roles	3
NURS 567	Nursing Informatics	3
NURS 595	Advanced Field Work in Nursing	3
NURS 649	Innovations and Health Care Organizations	3
Electives		3
<i>Non-thesis Track</i>		
Satisfactory completion of final MSN project and paper		
Total Credits		36-38

## Nursing Practice - Doctor of Nursing Practice

**DNP.** The Doctorate in Nursing Practice (DNP) at New Mexico State University prepares individuals who can assume advanced nursing practice roles in the focal areas of family practice, psychiatric/mental health, and adult/geriatric nursing. As a U.S./Mexico border community, DNP coursework is directed towards improving nursing care outcomes for individuals, families, communities and systems along the border. Students are encouraged to engage in those clinical experiences that address border and minority health issues and concerns. Within this context, the NMSU, DNP program emphasizes evidenced-based practice and the translation of research into practice as it relates to improving the care of individuals, families, groups and communities experiencing or at risk for health disparities. In addition to the BSN to DNP, the program includes tracks for post-MSN to DNP preparation for the certified advanced practice nurse and certificate programs in Family/Mental Health and Family Nurse Practitioner for those nurse practitioners seeking additional clinical certification.

## Requirements

### DNP Students

#### Core Courses

NURS 507	Nursing Research in Evidence-Based Practice	3
NURS 511	Advanced Pathophysiology for Clinical Nursing	3
NURS 512	Advanced Clinical Pharmacology	3
NURS 515	Advanced Health Assessment	3
NURS 565	Advanced Leadership in Healthcare	3-5
NURS 567	Nursing Informatics	3
NURS 630	Issues in Studying Health of Culturally Diverse and Border Populations	3
NURS 649	Innovations and Health Care Organizations	3
NURS 651	Applied Nursing Science for the APN	3
NURS 652	Translational Methods and Evidence-Based Practice	3
NURS 685	Epidemiology for Advanced Nursing Practice	2
NURS 697	Professional Roles for Advanced Practice Clinical Nursing	3
NURS 698	Advanced Practice Nursing Immersion	1-4
NURS 506	Health Policy for Advanced Nursing Practice	3
NURS 530	Promoting Health Behavior	3
NURS 690	Doctoral Nursing Seminar	1-3
Total Credits		43-50

### MSN to DNP

NURS 506	Health Policy for Advanced Nursing Practice	3
NURS 507	Nursing Research in Evidence-Based Practice	3
NURS 565	Advanced Leadership in Healthcare	3-5
NURS 567	Nursing Informatics	3
NURS 649	Innovations and Health Care Organizations	3
NURS 651	Applied Nursing Science for the APN	3
NURS 652	Translational Methods and Evidence-Based Practice	3
NURS 698	Advanced Practice Nursing Immersion	1-4
NURS 530	Promoting Health Behavior	3
NURS 685	Epidemiology for Advanced Nursing Practice	2
NURS 690	Doctoral Nursing Seminar	1-3
Total Credits		28-35

### Concentration: Psychiatric/ Mental Health Nurse

#### Required Courses

NURS 660	Family, Psychiatric Mental Health Nursing I	6
NURS 662	Family, Psychiatric-Mental Health Nursing II	5-7

NURS 664	Family, Psychiatric Mental Health Nursing III	5
NURS 514	Psychopharmacology for Advanced Practice	3
NURS 678	Health Needs of Special Populations	2-4
Total Credits		21-25

**Concentration: Adult/ Geriatric Nurse Practitioner**

The School of Nursing does not admit to this concentration every year. Please call the School of Nursing's- Graduate Nursing advisor for more information on these program requirements

**Concentration: Public/Community Health Nursing**

**Required Courses**

MPH 530	Epidemiological Approaches to Disease Control and Prevention	3
MPH 550	Environmental Public Health Issues	3
NURS 631	Population Based Approaches to Health Promotion	3
NURS 685	Epidemiology for Advanced Nursing Practice	2
Total Credits		11

**Concentration: Family Nurse Practitioner**

**Required Courses**

NURS 671	Primary Care I	6
NURS 672	Primary Care II	5-7
NURS 673	Primary Care III	5
NURS 676	Women's Health	3
NURS 678	Health Needs of Special Populations	2-4
Total Credits		21-25

**Public Health Sciences**

**Undergraduate Program Information**

The curriculum in public health prepares students for careers in community and public health programs, also in voluntary, private and governmental agencies. Upon completion of the degree, the graduate is eligible to take the national Certified Health Education Specialist (CHES) examination administered by the National Commission for Health Education Credentialing, Inc. The Bachelor of Public Health degree has the full approval of the Council on Education in Public Health.

Students seeking admission to the Bachelor of Public Health degree in the Department of Public Health Sciences at NMSU are first admitted as pre-public health (PPHL) students. Students keep this designation until they have met the following admissions requirements:

1. A cumulative grade-point average of at least 2.5 after completing specified general education coursework (the common core).
2. A grade of C- or better in prerequisite departmental courses
 

PHLS 150G	Personal Health and Wellness	3
PHLS 275 or PHLS 375	Foundations of Health Education Foundations of Community Health Education	3
PHLS 395	Foundations of Public Health	3
3. A grade of C- or better in MATH 120 Intermediate Algebra.

4. A grade of B or better in A ST 251G Statistics for Business and the Behavioral Sciences/STAT 251G Statistics for Business and the Behavioral Sciences or A ST 311 Statistical Applications.
5. Entrance Exam: A score of 37% or better on the Conventions of Written English assessment and 75% or better on the Math assessment.
6. Submission of an application packet that includes
  - a. a brief personal statement of interest in the profession, and
  - b. a completed application for the Bachelor of Public Health degree program.

The Bachelor of Public Health degree program accepts applicants during the Spring and Fall semesters. The deadlines for accepting application packets are September 15th for Spring admission and February 15th for Fall admission. All applications must be submitted to the College of Health and Social Services, CHSS, Room 326.

Applicants may receive a conditional acceptance into the program if they are currently enrolled in the last of the required prerequisites at the time that they submit an application to the Bachelor of Public Health degree program. Such conditional acceptance will be revoked if the applicant does not successfully complete each of the prerequisite courses.

Students must attain a grade of C- or better in all required PHLS core coursework.

Any student who receives two or more grades of D or F in required PHLS core courses must petition, in writing, to continue as a major. Unsuccessful petitioners will be dismissed from the program. Should said student receive any further grades of D or F they will be irrevocably dismissed from the BPH program.

**Graduate Program Information**

The Department of Public Health Sciences offers the Master of Public Health degree (MPH) in Community Health Education and Health Management, Administration, and Policy. The degree program prepares public health professionals to function in a variety of settings, including health programs at the local, state, and federal government levels; profit and nonprofit organizations and agencies; worksite settings; and educational institutions. The MPH program is fully accredited by the Council on Education for Public Health (CEPH).

**Admissions Requirements**

Students may be admitted on a full-time or part-time basis to the on-campus program or part-time in the fully online version of the program. The online Community Health Education program has curriculum and degree requirements in common with the on-campus program, and is covered by the same CEPH accreditation. The fully online Health Management, Administration, and Policy program is also fully accredited by CEPH. All coursework for the online degree can be completed off-campus utilizing web-based technologies and they are aimed at meeting the needs of working students and others for whom a campus-based program is not an option. In addition to meeting all admissions requirements of the Graduate School, applicants must meet the following departmental requirements:

- Complete a short biosketch and an essay describing the applicant's reasons for wishing to pursue the MPH degree at NMSU. Any paid or volunteer work performed in a public health or related agency setting should also be described in detail, including length of work and descriptions of the work typically performed as part of the job.

- Scores from a recent administration (within the past five years) of the GRE are required (verbal reasoning, quantitative reasoning, and analytical writing scores).
- Submit at least three letters of reference from former faculty and/or employers.

Applications are now completed online. Go to <http://gradschool.nmsu.edu/>. For more information, contact the Graduate Coordinator at [mphaps@nmsu.edu](mailto:mphaps@nmsu.edu), or obtained via the website: [publichealth.nmsu.edu](http://publichealth.nmsu.edu) (<https://publichealth.nmsu.edu>).

## Degrees for the Department

Public Health - Bachelor of Public Health (p. 661)

Public Health - Master of Public Health (p. 662)

Master of Public Health/Master of Social Work - Dual Degree (p. 660)

Public Health - Graduate Certificate (p. 661)

## Minors for the Department

Gerontology - Undergraduate Minor (p. 660)

Public Health Sciences - Undergraduate Minor (p. 662)

U.S.-Mexico Border Health Issues - Undergraduate Minor (p. 663)

### Professor, Karen Kopera-Frye, Interim Department Head

**Professors** Forster-Cox, Kopera-Frye, McDonald, Rao, Tomaka; **Associate Professors** Amatya, Kozel, Kratzke, Palacios, Wilson; **Assistant Professors** Morales

*Amatya, Ph.D. (U. of Illinois- Chicago) – biostatistics; J.E. Brandon, Ph.D., C.H.E.S. (Southern Illinois U.), emeritus – border health issues; S. Forster-Cox, Ph.D. (U. of New Mexico) Online Coordinator – community health education, health promotion, non-profit organizations, rural health; K. Kopera-Frye, Ph.D. (Wayne State University) - gerontology, health promotion and obesity among ethnically diverse groups, rural health, substance abuse; C. T. Kozel, Ph.D., C.H.E.S. (U. of New Mexico) – community health education, health policy analysis, administration; C. Kratzke, Ph.D., C.H.E.S. (Old Dominion U.) – community health education, health disparities, cancer; J. McDonald, Ph.D., (U Washington) - epidemiology; R. Palacios, Ph.D. (U. of Texas at El Paso) – stress, disease outcomes, program evaluation; E. Morales, Ph.D. (U. of Colorado Denver) – motivation, health behavior change; S. P. Rao, Ph.D., C.H.E.S. (Texas Women's U.) – Graduate Certificate and undergraduate Coordinator, domestic violence, HIV/AIDS, addictions, community health education; J. Robinson III, Ed.D., FAAHE (U. of Northern Colorado), emeritus – health education; J. Tomaka, Ph.D. (U. of Buffalo), Graduate Coordinator– health behavior, program evaluation; S.L. Wilson, Ph.D. (Southern Methodist U.) – health policy, rural health, international health, health disparities.*

## Public Health Sciences Courses

### PHLS 100. Introduction to Health Science

#### 1 Credit

An overview of professional career opportunities in the realm of health science as well as the functional roles of practice, education, administration, and research. Some field trips will be required.

### PHLS 150G. Personal Health and Wellness

#### 3 Credits

A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others.

### PHLS 275. Foundations of Health Education

#### 3 Credits

Role and responsibility of the health educator with emphasis on small group dynamics, oral and written communication skills, building community coalitions and an introduction to grant writing. Taught with PHLS 375. Cannot receive credit for both PHLS 275 and PHLS 375. May be repeated up to 3 credits.

**Prerequisite(s):** PHLS 150G, or consent of instructor.

### PHLS 295. Essentials of Public Health

#### 3 Credits

The course will focus on principles and major areas of public health, including ecological and total personal concept of health care system, epidemiological approaches to disease prevention and control. Consent of Instructor required.

### PHLS 301V. Human Sexuality

#### 3 Credits

Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles.

### PHLS 305V. Global Environmental Health Issues

#### 3 Credits

Introduction to global environmental health challenges in the 21st century with an emphasis on environmental problems as they affect public health and personal well-being.

### PHLS 375. Foundations of Community Health Education

#### 3 Credits

Role and responsibility of the health educator, with emphasis on small-group dynamics, oral and written communication skills, building community coalitions, and an introduction to grant writing. Equivalent to PHLS 275. May be repeated up to 3 credits.

### PHLS 380V. Women's Health Issues

#### 3 Credits

A focus on the unique issues and problems that confront women today and how they affect the health of women. Same as W S 381V.

### PHLS 395. Foundations of Public Health

#### 3 Credits

The course will focus on principles and major areas of public health, including ecological concepts of healthcare systems and epidemiological approaches to disease promotion and control. Equivalent to PHLS 295. May be repeated up to 3 credits. Restricted to: Public Health majors.

### PHLS 450. Epidemiology

#### 3 Credits

Epidemiologic approaches to disease prevention and control. Factors influencing health status. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 471.

**PHLS 451. Biometrics and Health Research****3 Credits**

Critical analysis of community health research and related methodologies. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** A ST 311G.

**PHLS 452. Environmental Health****3 Credits**

Introduction to environmental health designed to address public health issues. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** Junior or Senior standing.

**PHLS 457. Administration of Health Programs****3 Credits**

Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 395 or PHLS 450, or consent of instructor.

**PHLS 458. Public Health Resources and Policy Analysis****3 Credits**

Covers issues related to U.S.-health policy and allocation of resources. Examination of local, state, and federal public health and health care funding. Assessment of impact of health policy on health education, medical practice, and the workplace. May be repeated up to 3 credits.

**PHLS 459. Infectious and Noninfectious Disease Prevention****3 Credits**

History, etiology, and prevention of diseases affecting humans. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: MPH 559. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 395 and Consent of Instructor.

**PHLS 460. American Indian Health****3 Credits**

Critical health issues facing American Indians in the contemporary world. Course included in the undergraduate American Indian Program minor. May be repeated up to 3 credits. Crosslisted with: MPH 560.

**PHLS 461. Health Disparities: Determinants and Interventions****3 Credits**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. May be repeated up to 3 credits. Crosslisted with: MPH 561.

**PHLS 462. Hispanic Health Issues****3 Credits**

Cultural differences that aid or hinder communication with Hispanic clients and the application of cross-cultural communication skills. Some field trips may be required. May be repeated up to 3 credits. Crosslisted with: MPH 562.

**PHLS 464V. Cross-Cultural Aspects of Health****3 Credits**

An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles.

**PHLS 465. International Health Problems****3 Credits**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. May be repeated up to 3 credits. Crosslisted with: MPH 565.

**Prerequisite(s):** PHLS 395 or consent of instructor.

**PHLS 466. International Health Practicum****1-3 Credits**

Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits. Crosslisted with: MPH 566. Restricted to: Public Health majors.

**PHLS 467. Rural Health Issues****3 Credits**

Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. May be repeated up to 3 credits. Crosslisted with: MPH 567.

**PHLS 468. Coping with Loss and Grief: A Cross-Cultural Perspective****3 Credits**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included.

**PHLS 469. U.S.-Mexico Border Health Issues****3 Credits**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. May be repeated up to 3 credits. Crosslisted with: MPH 569.

**PHLS 471. Health Informatics****3 Credits**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. May be repeated up to 3 credits. Crosslisted with: MPH 571. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 395 or consent of instructor.

**PHLS 473. Health Program Planning****3 Credits**

Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. May be repeated up to 3 credits. Restricted to: Public Health majors.

**PHLS 475. Methods of Community Health Education****3 Credits**

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. May be repeated up to 3 credits. Crosslisted with: MPH 575. Restricted to: Public Health Majors majors.

**Prerequisite(s):** PHLS 275/375.

**PHLS 476. Theoretically-Based Interventions****3 Credits**

Identifying and developing interventions to problematic health-related behaviors. Taught with MPH 576. May be repeated up to 3 credits.

Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 473.

**PHLS 478. Health Program Evaluation and Research****3 Credits**

Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 473.

**PHLS 481. Public Health Preparedness and Response****3 Credits**

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits.

**PHLS 486. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PHLS 490. Independent Study****1-6 Credits**

Individual studies with prior approval of department head. Maximum of 12 credits. May be repeated up to 12 credits. Consent of Instructor required.

**PHLS 496. Community Health Education Field Experience****1-6 Credits**

Senior-standing community health education majors will integrate and apply various concepts related to actual community health education practice. Experience aims to prepare students to integrate the competencies and responsibilities of community health education. Approximately 55 hours at field agency required per credit hour. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 475 or concurrent enrollment.

**PHLS 497. Senior Seminar in Community Health Education****1 Credit**

Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. May be repeated up to 1 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 475 or consent of instructor.

**PHLS 499. Problems in Health Education****3 Credits**

Provides opportunity for synthesis of program planning, implementation, and evaluation methodologies in the preparation and delivery of health education topics. Some field trips will be required. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** Either PHLS 395, PHLS 478, PHLS 476, or consent of instructor.

## Master of Public Health Courses

**MPH 500. Orientation to Public Health****3 Credits**

Introduction to the historical and contemporary perspectives of public health theory and practice. Includes an investigation of public health as a discipline, a profession, and the programmatic attempts to improve health status.

**MPH 510. Community and Psychosocial Aspects of Public Health****3 Credits**

Social, behavioral, and educational aspects of disease prevention and health promotion programs. Restricted to MPH majors.

**MPH 515. Introduction to Gerontology****3 Credits**

Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population.

**MPH 520. Biostatistical Applications in Public Health****3 Credits**

Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors.

**MPH 530. Epidemiological Approaches to Disease Control and Prevention****3 Credits**

Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors.

**MPH 540. Health Services System: Administration and Organization****3 Credits**

This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health services organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 541. Principles of Health Program Management****3 Credits**

This course prepares the student to assume a supervisory role in the management of health and human services programs. The course will cover essential management functions such as leadership, organizational assessment, planning, decision-making, organizational structure, budgeting, marketing, and human resource management. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 545. Health Services Organization and Delivery****3 Credits**

This course includes the framework of the United States healthcare system; organization and administration of health services; alternate ways of organizing and financing health systems; the roles of the government and free market on health care services; and the barriers to health services delivery. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 546. Public Health Finance and Budget Management****3 Credits**

Introduces health care accounting and finance to non-financial students. Students are exposed to the financial structure of health care organizations and the environment within which they operate. Instruction also introduces the use of accounting and financial information in investor-owned and not-for-profit organizations in the health care industry. Topics include understanding the creation and interpretation of financial statements, financial accounting and reporting requirements, financial analysis, budgeting, and resource allocation. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 547. Public Health Law and Ethics****3 Credits**

This course examines major legal and ethical concepts and their impact on public health policy and practice. The course examines governmental authority, at various jurisdictional levels, to improve public health. This course will focus on public health law in the United States. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 550. Environmental Public Health Issues****3 Credits**

Environmental health issues from a public health perspective. Restricted to MPH majors.

**MPH 557. Health Promotion for the Older Adult****3 Credits**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings.

**MPH 558. Public Health Policy Analysis****3 Credits**

Covers issues related to U.S.-health policy and allocation of resources. Examination of local, state, and federal public health and health care funding. Assessment of impact of health policy on health education, medical practice, and the workplace. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 559. Infectious and Noninfectious Disease Prevention****3 Credits**

History, etiology, and prevention of diseases affecting humans. Consent of Instructor required. Crosslisted with: PHLS 459.

**MPH 560. American Indian Health****3 Credits**

Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits. Crosslisted with: PHLS 460.

**MPH 561. Health Disparities: Determinants and Interventions****3 Credits**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. May be repeated up to 3 credits. Crosslisted with: PHLS 461.

**MPH 562. Hispanic Health Issues****3 Credits**

Cultural differences that aid or hinder communication with Hispanic clients and the application of cross-cultural communication skills. Some field trips may be required. May be repeated up to 3 credits. Crosslisted with: PHLS 462.

**MPH 564. Cross-Cultural Aspects of Health****3 Credits**

An examination of health practices from a variety of cultural perspectives; communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits. Crosslisted with: PHLS 464V.

**MPH 565. International Health Problems****3 Credits**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. May be repeated up to 3 credits. Crosslisted with: PHLS 465.

**MPH 566. International Health Practicum****1-3 Credits**

Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits. Crosslisted with: PHLS 466.

**MPH 567. Rural Health Issues****3 Credits**

Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Crosslisted with: PHLS 467.

**MPH 568. Coping with Loss and Grief: A Cross-Cultural Perspective****3 Credits**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. May be repeated up to 3 credits. Crosslisted with: PHLS 468.

**MPH 569. U.S.-Mexico Border Health Issues****3 Credits**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. May be repeated up to 3 credits. Crosslisted with: PHLS 469.

**MPH 570. Foundations of Public Health Education****3 Credits**

Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education.

**MPH 571. Health Informatics****3 Credits**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. May be repeated up to 3 credits. Crosslisted with: PHLS 471.

**MPH 572. Techniques of Health Communication/Education****3 Credits**

Application of a wide range of communication and education theories/methods, including program planning and evaluation, in public health programming. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 573. Community Organization in Public Health****3 Credits**

Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 574. Health Program Planning****3 Credits**

Covers process of successful public health education program planning and grant writing. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 575. Methods of Community Health Education****3 Credits**

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Crosslisted with: PHLS 475.

**Prerequisite(s):** MPH 510.

**MPH 576. Theoretically-Based Interventions****3 Credits**

Identifying and developing interventions to problematic health-related behaviors. May be repeated up to 3 credits. Crosslisted with: PHLS 476. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 578. Evaluative Approaches in Public Health****3 Credits**

Survey and analyses of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques. Restricted to: MPH majors.

**Prerequisite(s):** MPH 520.

**MPH 579. Research and Resources in Community Health****3 Credits**

Exploration of available public health research studies, data, results and implications. Restricted to MPH majors.

**Prerequisite(s):** MPH 520.

**MPH 581. Public Health Preparedness and Response****3 Credits**

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits. Crosslisted with: PHLS 481.

**MPH 586. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits. Restricted to: MPH majors.

**MPH 590. Independent Study****1-6 Credits**

Individual studies with prior approval of department head. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**MPH 593. Adulthood and Aging****3 Credits**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies.

**MPH 596. Field Experience****1-4 Credits**

Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. May be repeated for a maximum of 4 credits. Restricted to MPH majors.

**Prerequisite:** consent of department head.

**MPH 597. Graduate Public Health Seminar****1 Credit**

Inter-professional Education Seminar for MPH students.

**MPH 599. Master's Thesis****1-6 Credits**

Minimum of 4 credits required but may be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required. Thesis/Dissertation Grading.

**Name:** Cathy Lindsay

**Office Location:** HSS room 326

**Phone:** (575) 646-4300

**Website:** <http://publichealth.nmsu.edu/>

## Gerontology - Undergraduate Minor

### On-Line Program Only

A grade of C- or better is required for all minor requirements.

**Core Gerontology Courses**

GERO 415	Introduction to Gerontology	3
GERO 493	Adulthood and Aging	3
Select 6 credits from the following:		6
FCS 213	Adult Development and Aging	
GERO 450	Health Promotion for the Older Adult	
GERO 451	Aging and Public Policy	
NURS 416	Older Adult Nursing	
Additional Independent Study (to be arranged with either Public Health or Nursing department)		

Total Credits

12

## Master of Public Health/Master of Social Work - Dual Degree

The department of Public Health Sciences and the School of Social Work offer a dual MPH/MSW degree program. The two degrees are:

1. Master of Public Health (MPH) in Community Health Education and
2. Master of Social Work (MSW).

Student interested in pursuing the dual degree program must:

- Prepare and submit separate admissions applications to both programs
- Notify each program in writing of the intent to pursue the dual degree program
- Be officially admitted to both degree programs
- Notify the NMSU Graduate School of the intent to pursue the dual degree program
- Complete all course requirements
- Complete separate final examinations for both degree programs

If you are interested in pursuing this option please call and talk with the Dual Program Coordinator in the MPH program. The dual degree waives some courses from each program and students enrolled in this program should expect to complete the program in three years.

## Public Health - Bachelor of Public Health

### General Education Requirements (35 credits)

General education requirements for the Department of Public Health Sciences follow those outlined by the university in this catalog.

### Departmental Requirements

You are required to complete the following Public Health Sciences core courses. Of the 120 credits required for the degree, you must have a minimum of 48 upper division credit hours (300- and 400-level courses).

#### General Education Requirements

Select 35 credits of General Education Requirements

#### Viewing a Wider World Courses 6

#### Prerequisite Courses

A ST 311	Statistical Applications <sup>1</sup>
or A ST 251G	Statistics for Business and the Behavioral Sciences
PHLS 150G	Personal Health and Wellness
PHLS 275	Foundations of Health Education
or PHLS 375	Foundations of Community Health Education
PHLS 395	Foundations of Public Health
MATH 120	Intermediate Algebra

#### Public Health Education Core

PHLS 471	Health Informatics	3
PHLS 473	Health Program Planning	3
PHLS 475	Methods of Community Health Education	3
PHLS 459	Infectious and Noninfectious Disease Prevention	3
PHLS 478	Health Program Evaluation and Research	3
PHLS 496	Community Health Education Field Experience	6

PHLS 497	Senior Seminar in Community Health Education	1
PHLS 499	Problems in Health Education	3

#### Public Health Core

PHLS 450	Epidemiology	3
PHLS 451	Biometrics and Health Research	3
PHLS 452	Environmental Health	3
PHLS 457	Administration of Health Programs	3
PHLS 476	Theoretically-Based Interventions	3

#### Cultural Foundations Course Requirements

Select 3 credits from the following:		3
PHLS 461	Health Disparities: Determinants and Interventions	
PHLS 462	Hispanic Health Issues	
PHLS 464V	Cross-Cultural Aspects of Health	
PHLS 465	International Health Problems	
PHLS 466	International Health Practicum	
PHLS 467	Rural Health Issues	
PHLS 468	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 469	U.S.-Mexico Border Health Issues	

#### Departmental Electives

Elective courses <sup>2</sup>		24
Electives: to bring the total to 120 credits, with 28 credits being upper-division		47
Total Credits		120

<sup>1</sup> A ST 311 Statistical Applications: does not meet the Common Core Area II.

<sup>2</sup> Students are encouraged to select additional PHLS and GERO courses to satisfy the elective requirement. Students with an associate degree in an allied health field may transfer up to 24 credit hours of electives.

### Additional Requirements

All students are required to complete an exit survey please see the department for more information.

### Public Health - Graduate Certificate

The graduate certificate program in public health is not an official graduate degree offered by NMSU but rather a focused collection of courses that enrolled students complete in public health. These courses are designed to provide and/or enhance students' knowledge of and skills in public health practice. Those students who successfully complete the previously listed courses receive a certificate of completion statement on their official transcript and a formal certificate from the university.

#### Certificate Program Courses

MPH 510	Community and Psychosocial Aspects of Public Health	3
MPH 530	Epidemiological Approaches to Disease Control and Prevention	3
MPH 540	Health Services System: Administration and Organization	3
MPH 550	Environmental Public Health Issues	3

Elective <sup>1</sup>	3
<b>Total Credits</b>	<b>15</b>

<sup>1</sup> For those who have not had any statistics courses it is strongly recommended that they complete MPH 520 Biostatistical Applications in Public Health as their elective.

Note that students who complete the Graduate Certificate are eligible to sit for the Certified Public Health (CPH) examination.

Apply online at <http://gradschool.nmsu.edu/>. International students are required to contact the Center for International Programs at (575) 646-5480.

## Public Health - Master of Public Health

### Public Health Core Courses

MPH 510	Community and Psychosocial Aspects of Public Health	
MPH 520	Biostatistical Applications in Public Health	
MPH 530	Epidemiological Approaches to Disease Control and Prevention	
MPH 540	Health Services System: Administration and Organization	
MPH 550	Environmental Public Health Issues	

### Concentrations

Select one from the following concentrations:	18
Community Health Education	
Health Management, Administration, and Policy	

### Cultural Foundation Course

Select 3 credits from the cultural foundation series numbered MPH 560-MPH 569	3
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### Additional Requirements

MPH 596	Field Experience	
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### Thesis and Non-thesis Options

Select one of the following options in consultation with your graduate advisor:	
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#### Thesis Option <sup>1</sup>

MPH 599	Master's Thesis	
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<i>Non-Thesis Option</i> <sup>2</sup>	3
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Select 3 credits from electives	
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<b>Total Credits</b>	<b>24</b>
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<sup>1</sup> Only for those in the Community Health Education concentration

<sup>2</sup> Available for those in the Community Health Education concentration and the Health Management, Administration & Policy concentration

## Concentration: Community Health Education

MPH 570	Foundations of Public Health Education	3
MPH 572	Techniques of Health Communication/ Education	3
MPH 573	Community Organization in Public Health	3

MPH 574	Health Program Planning	3
MPH 578	Evaluative Approaches in Public Health	3
MPH 579	Research and Resources in Community Health	3
<b>Total Credits</b>		<b>18</b>

## Concentration: Health Management, Administration, and Policy

MPH 541	Principles of Health Program Management	3
MPH 545	Health Services Organization and Delivery	3
MPH 546	Public Health Finance and Budget Management	3
MPH 547	Public Health Law and Ethics	3
MPH 558	Public Health Policy Analysis	3
MPH 578	Evaluative Approaches in Public Health	3
<b>Total Credits</b>		<b>18</b>

Elective courses may include other MPH courses or 500-level courses from other departments. Some MPH courses are crossed listed with PHLS 400 level courses (e.g PHLS 467 Rural Health Issues and MPH 567 Rural Health Issues). Students who have previously taken one of these 400 level courses at NMSU, may not take the corresponding 500 level MPH course for degree completion credit.

The thesis option requires a total of 45 credit hours, while the non-thesis option requires 42 credit hours. Final examination for the non-thesis option includes both oral and written questions pertaining to the student's graduate course work. Final examination for the thesis option consists of an oral defense of the thesis and related course work.

Selected elective and option courses may also be available during summer sessions.

All MPH students must comply with the Student Code of Conduct for the Department of Public Health Sciences. This can be found online at the Department's web page. (<http://publichealth.nmsu.edu>)

Students completing the Community Health Education concentration are eligible to sit for the Certified Health Education Specialist (CHES) examination. Students completing either the Community Health Education or the Health Management, Administration, and Policy concentration are eligible to sit for the Certified Public Health (CPH) examination.

## Public Health Sciences - Undergraduate Minor

A grade of C- or better is required for all minor requirements.

### Core Public Health Education Courses

PHLS 275	Foundations of Health Education	3
PHLS 395	Foundations of Public Health	3
PHLS 450	Epidemiology <sup>1</sup>	3
PHLS 457	Administration of Health Programs	3
Select one from the following:		3
PHLS 301V	Human Sexuality	

PHLS 380V	Women's Health Issues	
Select 3 credits from the following:		3
PHLS 461	Health Disparities: Determinants and Interventions	
PHLS 462	Hispanic Health Issues	
PHLS 464V	Cross-Cultural Aspects of Health	
PHLS 465	International Health Problems	
PHLS 466	International Health Practicum	
PHLS 467	Rural Health Issues	
PHLS 468	Coping with Loss and Grief: A Cross-Cultural Perspective	
Total Credits		18

<sup>1</sup> All public health minors must complete A ST 251G Statistics for Business and the Behavioral Sciences/STAT 251G Statistics for Business and the Behavioral Sciences or A ST 311 Statistical Applications with a B or better before taking PHLS 450 Epidemiology.

## U.S.-Mexico Border Health Issues - Undergraduate Minor

A grade of C- or better is required for all minor requirements.

### Core Requirements

Select 3 credits from the following:		3
PHLS 466	International Health Practicum	
PHLS 469	U.S.-Mexico Border Health Issues	
Select four from the following:		12
PHLS 461	Health Disparities: Determinants and Interventions	
PHLS 462	Hispanic Health Issues	
PHLS 464V	Cross-Cultural Aspects of Health	
PHLS 465	International Health Problems	
PHLS 467	Rural Health Issues	
PHLS 486	Special Topics	
PHLS 486	Special Topics (when subtitle relates to US-Mexico Border Health)	
PHLS 481	Public Health Preparedness and Response	3
Total Credits		18

## Social Work

### Undergraduate Program Information

The BSW degree (CSWE accredited) allows you to join a profession dedicated to helping people in personal and social situations. As a unique and challenging field, social work addresses the complexity of human behavior and the ever-present needs and potential of people. From rural communities to inner cities, social workers are at work in social service agencies, mental health centers, hospitals, schools, neighborhood organizations, probation offices and private agencies. Social work roles are varied and flexible. Social workers practice in areas such as child abuse, community organization, direct services with individuals and families, mental health, group work, and the administration, planning and development of social programs. With each consumer group and in every agency setting, social workers help to correct the causes or alleviate the

results of poverty, racism, poor health, mental illness or any condition that prohibits people from reaching their potential.

## Graduate Program Information

The School of Social Work offers full-time and part-time graduate study in Las Cruces and Albuquerque leading to the Master of Social Work (MSW) degree. The program is designed to provide academic and fieldwork education with an emphasis in Advanced Generalist Practice with Populations of the Southwest based on the foundation first year of generalist practice. The program is fully accredited by the Council on Social Work Education (CSWE).

Admission to the program is in accordance with the general regulations of the Graduate School, which include a completed undergraduate degree from an accredited institution. In addition to applying to the Graduate School, application must also be made to the School of Social Work. The application to the School of Social Work spells out admission requirements that include submitting an application form, a written statement, a current resume and personal references and statistics course. Applicants having a degree from a non-liberal arts area must show coursework that includes two courses from the humanities, two from the natural and biological sciences (with one course containing content in human biology) and three from the behavioral and social sciences, with at least one course in sociology or psychology. Applicants are also required to complete a Basic Statistics course prior to beginning their MSW program of study. The program does not grant academic credit for work or other life experience in lieu of social work course or field content.

The School of Social Work is committed to ensuring a culturally diverse student population to enhance the social work profession at both state and national levels. To meet this goal of diversity, the school makes an effort to recruit and retain a diverse student population.

Applicants who qualify for advanced standing may complete the program with 34 credits rather than 60 credits. Admission to the advanced-standing program is for highly qualified applicants who have a Bachelor of Social Work degree (BSW) from a social work program accredited by the CSWE and earned within seven years of beginning the advanced standing program, a cumulative GPA of at least 3.0 and a minimum GPA of 3.5 in core Undergraduate Social Work courses.

## Degrees for the Department

Social Work - Bachelor of Social Work (p. 668)

Social Work - Master of Social Work (p. 669)

Master of Social Work/Master of Public Health - Dual Degree (p. 671)

## Minors for the Department

Alcohol and Drug Counseling - Graduate Minor (p. 671)

Iván de la Rosa, PhD, LMSW, Interim Director

**Professors** Wagner; **Associate Professors** Blair, de la Rosa, Gurrola, Nedjat-Haiem, Whittlesey-Jerome; **Assistant Professor** Finno-Velasquez, Gergerich, Gherardi; **College Associate Professor** Cabada; **College Assistant Professors** Montoya, Ortiz

*R. Blair, PhD (Utah)– mental health, individual therapy; O. Cabada, MSW (Texas) - mental health, social justice; I. de la Rosa, PhD (Michigan)– program evaluation, research; M. Finno-Velasquez, PhD (California)-child welfare; E.*

*Gergerich, PhD (Arkansas) - gerontology; S. Gherardi, PhD (Illinois) - school social worker; M. Gurrola, PhD (Arizona) - social justice, immigration; M. Montoya, MSW (New Mexico) - child welfare; F. Nedjat-Haiem, PhD (California) - gerontology; M. Ortiz, MSW (New Mexico) - cultural competence, practice; D.L. Wagner, PhD (Oregon) - gerontology, community planning; W. Whittlesey-Jerome, PhD (Texas) - mental health, policy, research*

## Social Work Courses

### S WK 221G. Introduction to Social Welfare

#### 3 Credits

A broad overview of current social problems and the role of social agencies and community members in addressing these problems.

### S WK 251. Women s Issues in Social Work

#### 3 Credits

Examines gender-specific social problems and their identification and resolution through the use of social agencies and community resources. Community Colleges only.

### S WK 253. Case Management

#### 3 Credits

Introduction to case management for social- and human-services workers. Overview of typical duties and responsibilities of a case manager, including setting goals, performing assessments, writing progress notes, and linking clients with other resources in the community. Recommended for students considering a career in social work or human services. Community Colleges only.

**Prerequisites:** PSY 201G and S WK 221G.

### S WK 300. Social Work Practice Skills

#### 3 Credits

Introduction to generalist social work practice. Interpersonal skills, values, and ethics required in the helping relationship. Taught in a small-group format. May be repeated up to 3 credits. Restricted to: S WK majors. Restricted to Las Cruces campus only.

### S WK 301. Orientation to Field

#### 1 Credit

This course will provide an orientation to requirements for a social work field practicum and to establish the transfer of learning between classroom instruction and future practicum skill application. Restricted to S WK majors.

**Corequisite(s):** S WK 300.

### S WK 309. Sociocultural Concepts

#### 3 Credits

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are examined.

### S WK 311. Human Behavior and the Social Environment I

#### 3 Credits

Major theories of human behavior and the life span from conception to adolescence. Restricted to: S WK majors.

**Corequisite(s):** S WK 309.

### S WK 312. Human Behavior and the Social Environment II

#### 3 Credits

Continuation of S WK 311. Major theories of human behavior and the life span from young adulthood through old age. Restricted to: S WK majors.

**Prerequisite(s):** S WK 311.

### S WK 313. Social Work Practice with Individuals

#### 3 Credits

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with individual client systems. Restricted to: S WK majors.

**Prerequisite(s):** S WK 300.

### S WK 315. Social Work Practice with Families

#### 3 Credits

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with multicultural family systems. May be repeated up to 3 credits.

**Prerequisite(s):** S WK 300.

### S WK 316. Social Work Research

#### 3 Credits

This undergraduate course is designed to prepare students to be effective consumers of research and to evaluate their own practice. Students will learn to read, critically evaluate and use the research of others to select interventions that are based on evidence of effectiveness. Students will demonstrate the knowledge, values and skills to be critical consumers of research for effective and ethical practice as well as possess the basic skills necessary to evaluate their own social work professional practice. May be repeated up to 3 credits. Restricted to: Restricted to Social Work majors.

**Prerequisite(s):** STAT 251G, STAT 271G or A ST 251G.

### S WK 331V. Introduction to Social Policy: History

#### 3 Credits

Historical overview of the economic, political, and cultural impact on social welfare policy, institutions, and professions with international content.

### S WK 401. Field Experience I

#### 3 Credits

This course is a social work practicum at a university approved agency. This course focuses on generalist social work practice. At this level students are expected to assume substantive responsibility for carrying out social work activities at the beginning level of social work practice.

- Students are given the opportunity to observe and assume social work activities in direct and indirect practice under close supervision.
- These field work opportunities enable students to apply and integrate previous and current semester learning.
- Opportunities will be available for students to develop knowledge of professional practice at multiple system levels and with a variety of cultural, ethnic, racial, gender and age groups.
- Students in this Field Practicum Course are required to take a Field Seminar that will provide the students the opportunity to discuss the integration of academic and practice experience learning. Restricted to: S WK majors. S/U Grading (S/U, Audit).

**Corequisite(s):** S WK 412.

**S WK 403. Social Work Practicum II****3 Credits**

This course is a social work practicum at a university approved agency. This course focuses on generalist social work practice. At this level students are expected to assume substantive responsibility for carrying out social work activities at the beginning level of social work practice.

- Students are given the opportunity to observe and assume social work activities in direct and indirect practice under close supervision.
- These field work opportunities enable students to apply and integrate previous and current semester learning.
- Opportunities will be available for students to develop knowledge of professional practice at multiple system levels and with a variety of cultural, ethnic, racial, gender and age groups.
- Students in this Field Practicum Course are required to take a Field Seminar that will provide the students the opportunity to discuss the integration of academic and practice experience learning.

Restricted to: S WK majors.

**Corequisite(s):** SWK 419.

**S WK 405. Service Learning****3 Credits**

This course introduces students to field work as an essential component of social work education. Students are required to provide a minimum of 40 hours of service to a human services agency. This course will focus on the connection between coursework, field work, the NASW Code of Ethics and skills needed to work with people.

**Prerequisite(s):** S WK 301, S WK 313.

**S WK 412. Practicum Seminar I****3 Credits**

This practicum seminar course must be taken with SWK 401 to provide students who are enrolled in the field practicum course the opportunity to discuss and reflect on social work knowledge, values and skills as they interact with clients in their practicum placement.

- Students will have an opportunity to present a case and discuss how they are able to integrate the nine social work competencies
- The seminar will provide opportunities to integrate previous and current semester learning.

Restricted to: S WK majors. S/U Grading (S/U, Audit).

**Corequisite(s):** S WK 401.

**S WK 415. Generalist Social Work Practice with Organizations and Communities****3 Credits**

This course focuses on generalist social work values, knowledge and skills regarding practice with larger systems. Course content will include theories of community and organizational assessment and intervention. Strategies for advocacy and change, leadership for community and organizational change. May be repeated up to 3 credits.

**Prerequisite(s):** S WK 300, S WK 313, S WK 315.

**Corequisite(s):** S WK 417.

**S WK 416. Generalist Social Work Practice with Groups****3 Credits**

Generalist social work practice skills with group client systems focusing on the planned change process and the empowerment of oppressed populations. May be repeated up to 3 credits. Restricted to: S WK majors.

**Prerequisite(s):** SWK 415.

**S WK 417. Social Welfare Policy: Legislation****3 Credits**

Policy practice related to the formation of current social welfare policies that promote social and economic justice. Emphasis is on the development and influences of social policy, policy analysis, and the policy change process. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: S WK majors.

**S WK 418. Professionalism in the Field of Social Work****3 Credits**

This course is designed to prepare you to develop professional skills, knowledge, awareness and boundaries as a social worker as you get ready to enter the field practicum. May be repeated up to 3 credits.

Restricted to: S WK majors.

**Corequisite(s):** S WK 419.

**S WK 419. Practicum Seminar II****3 Credits**

This practicum seminar course must be taken with S WK 403 to provide students who are enrolled in the field practicum course the opportunity to discuss and reflect on social work knowledge, values and skills as they interact with clients in their practicum placement.

- Students will have an opportunity to present a case and discuss how they are able to integrate the nine social work competencies
- The seminar will provide opportunities to integrate previous and current semester learning.

May be repeated up to 3 credits. Restricted to: S WK majors. S/U Grading (S/U, Audit).

**Corequisite(s):** S WK 403.

**S WK 443. Family and Child Welfare Practice****3 Credits**

Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning. Cannot receive credit for S WK 443 and M SW 543.

**S WK 447. Identifying Mental Health Concerns****3 Credits**

This course is designed to advance students' knowledge and professional skills for addressing mental health concerns in social work practice at the bachelor's level. Students will learn to identify major mental health concerns across the life span. Culturally competent practices are considered in regard to various mental health concerns. Restricted to: SWK majors.

**S WK 449. Independent Study****1-6 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head.

**Prerequisite:** majors or consent of instructor.

**S WK 490. Family and Child Welfare Policy****3 Credits**

This course is designed to provide students with an understanding of the history and evolution of child welfare policies, initiatives and factors that influence advocacy and practices within the child welfare system. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. Taught with MSW 590. Students enrolled in S WK 490 will not receive credit MSW 590. Students enrolled in S WK 490 will not receive credit MSW 590.

**S WK 497. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Restricted to: S WK majors.

**Prerequisite(s):** Junior or above standing, majors or consent of instructor.

## Master of Social Work Courses

### **MSW 500. Social Problems and Social Welfare Policy 3 Credits**

An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to change policies that impact vulnerable populations. May be repeated up to 3 credits.

### **MSW 503. Policy Analysis and Change 3 Credits**

This course will emphasize policy practice focusing on policy analysis and creating and implementing policy change. Restricted to MSW majors.  
**Prerequisite(s):** MSW 500.

### **MSW 509. Sociocultural Concepts and Populations of the Southwest 3 Credits**

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are emphasized.

### **MSW 510. Human Behavior and the Social Environment I 3 Credits**

The major theories of human behavior and the life span from conception to adolescence. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Required. May be repeated up to 3 credits. Restricted to: MSW majors.  
**Corequisite(s):** MSW 509.

### **MSW 514. Human Behavior & the Social Environment II 1-3 Credits (1-3)**

The major theories of human behavior from young adulthood to old age. This course will focus on both areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Consent of Instructor required. Restricted to: MSW majors.  
**Prerequisite(s):** MSW 510.

### **MSW 520. Social Work Practice I 3 Credits**

This is the first course of a two-course sequence. An introduction to the generalist crosscultural, social work practice perspective with individuals and families, focusing on social work as a profession, social work knowledge base, professional development, relationship building and assessment with individuals and families within a framework of social work values and ethics. May be repeated up to 3 credits.  
**Corequisite(s):** MSW 549 and MSW 566, or MSW 551.

**Prerequisite(s)/Corequisite(s):** MSW 510. Restricted to: MSW majors.

### **MSW 521. Social Work Practice II 3 Credits**

This is the second course of a two-course sequence. A continuation of the generalist crosscultural, social work practice perspective with individuals and families, focusing on goal setting, contracting, implementation, and outcome assessment. The course also applies the generalist practice perspective and methods to larger systems: groups, organizations, and communities and includes relationship building, assessment, goal setting, contracting, implementation and outcome assessment within a framework of social work values and ethics. May be repeated up to 3 credits. Restricted to: MSW majors.  
**Prerequisite(s):** MSW 520.

**Corequisite(s):** MSW 550 and MSW 567, or MSW 552.

### **MSW 524. Practice III: Advanced Practice with Individuals 3 Credits**

This class builds on Foundation Year Practice courses (MSW 520, 521) by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 521.

**Corequisite(s):** MSW 556 and MSW 568, or MSW 554.

### **MSW 525. Practice IV: Advanced Generalist Practice with Groups 3 Credits**

This course will address the knowledge, values and skills needed to work effectively with diverse populations in group settings. The course will build on Foundation Year courses (MSW 520 and 521) by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 521.

**Corequisite(s):** MSW 556 and MSW 568, or MSW 554.

### **MSW 526. Practice V: Advanced Practice with Families 3 Credits**

This class builds on Foundation Year Practice courses (MSW 520 and 521) by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. May be repeated up to 3 credits. Restricted to: S WK, MSW majors.

**Prerequisite(s):** MSW 524, MSW 525.

**Corequisite(s):** MSW 557 and MSW 569, or MSW 555.

### **MSW 527. Practice VI: Advanced Practice with Organizations and Communities 3 Credits**

This class builds on Foundation Year Practice courses (MSW 520, 521) by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 524, MSW 525.

**Corequisite(s):** MSW 557 and MSW 569, or MSW 555.

### **MSW 547. Social Work Mental Health Practice 3 Credits**

This course is designed to add to the practice sequence for Masters Level students in Social Work. It addresses social work assessment of major mental health issues across the life span with an emphasis on resiliency and coping skills. Culturally responsive practices are applied to the major issues of mental health. Basic psychopharmacology, neurobiology and the ways in which Social Workers interact with clients to aid education and effective treatment of medical interventions will be a prominent part of this course. Evidence-based practices useful for work in various disorders will be incorporated. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 520.

**MSW 549. Generalist Field Practicum A****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning; seminar required. Evaluation criteria for this course will include upholding social work practice standards for interpersonal and ethical conduct. Total of 225 hours in the field each semester is required. 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors. S/U Grading (S/U, Audit).

**Corequisite(s):** MSW 520, MSW 566.

**MSW 550. Generalist Field Practicum B****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning; seminar required. Evaluation criteria for this course will include upholding social work practice standards for interpersonal and ethical conduct. Total of 225 hours in the field each semester is required. Letter grade, 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 549.

**Corequisite(s):** MSW 521, MSW 567.

**MSW 551. Generalist Field Practicum I****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Graded: S/U. Pre/ Crosslisted with: MSW 566. Restricted to: MSW majors. S/U Grading (S/U, Audit).

**Corequisite(s):** MSW 520.

**MSW 552. Generalist Field Practicum II****3 Credits**

Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Crosslisted with: MSW 567. Restricted to: MSW majors.

**Prerequisite(s):** MSW 551.

**Corequisite(s):** MSW 521.

**MSW 554. Advanced Generalist Field Experience I****3 Credits**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Crosslisted with: MSW 568. Restricted to: MSW majors.

**Prerequisite(s):** MSW 552.

**Corequisite(s):** MSW 524, MSW 525.

**MSW 555. Advanced Generalist Field Experience II****3 Credits**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Crosslisted with: MSW 559. Restricted to: MSW majors.

**Prerequisite(s):** MSW 554.

**Corequisite(s):** MSW 526, MSW 527.

**MSW 556. Advanced Generalist Field Practicum A****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning in advanced generalist practice: seminar required. Total of 250 hours in the field each semester is required. Letter grade, 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 550.

**Corequisite(s):** MSW 524, MSW 525, MSW 568.

**MSW 557. Advanced Generalist Field Practicum B****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning in advanced generalist practice: seminar required. Total of 250 hours in the field each semester is required. Letter grade, 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 556.

**Corequisite(s):** MSW 526, MSW 527, MSW 569.

**MSW 559. Social Work Practice & Research for Advanced Standing****4 Credits**

This course is required for all advanced standing students and targets provision of the conceptual orientation for the concentration year of the MSW program. The goal of this course is to enhance social work practice theory, knowledge and application skills as well as knowledge in preparation for concentration year courses in advanced generalist social work practice. The key themes and concepts presented, explored and analyzed in this course include: the fit between Social Work code of ethics and personal values and belief systems; analysis of theory, ethics, and conceptual frameworks for concentration year advanced evidenced based Social Work practice courses in diverse settings. Restricted to: MSW Advanced Standing majors.

**MSW 560. Social Work Research I****3 Credits**

Introduction to analytical skills used in social work research: problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human participants in research, and application of research knowledge and professional ethics to social work practice. May be repeated up to 3 credits. Restricted to: MSW majors.

**Corequisite(s):** MSW 500.

**MSW 562. Social Work Research II****3 Credits**

Focused on advanced generalist practice research in multicultural settings. Advanced skills to evaluate practice with individuals, families, groups, organizations, and communities in multicultural settings. Needs assessment as well as program and practice evaluation are emphasized. Restricted to: MSW majors.

**Corequisite(s):** MSW 560.

**MSW 566. Generalist Field Seminar I****3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MSW 551 or MSW 549, MSW 509, MSW 510, MSW 520. Restricted to: MSW majors. S/U Grading (S/U, Audit).

**MSW 567. Generalist Field Seminar II****3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 566.

**Corequisite(s):** MSW 521, MSW 550.

**MSW 568. Advanced Generalist Field Seminar I**  
**3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits. Crosslisted with: MSW 554. Restricted to: MSW majors.

**Prerequisite(s):** MSW 567.

**Corequisite(s):** MSW 556, MSW 524, MSW 525.

**MSW 569. Advanced Generalist Field Seminar II**  
**3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 568.

**Corequisite(s):** MSW 526, MSW 527, MSW 557.

**MSW 590. Family and Child Welfare Policy**  
**3 Credits**

This course will enhance students' ability to offer child welfare services that respect cultural differences, reflect current policy knowledge concerning child maltreatment, build on the advocacy and protective capacities of individuals, families and communities and encourage permanency for children and preservation of families. Required basic knowledge of child welfare and assessment skills. Outside majors require instructor permission. May be repeated up to 3 credits.

**MSW 591. Systemic Integration of Alcohol and Drug Issues**  
**3 Credits**

Capstone course for the alcohol and drug minor. Covers community, agency, and systemic facilitation of prevention and intervention services for substance-affected families.

**Prerequisite(s):** acceptance into minor or Instructor permission.

**MSW 595. Independent Study**  
**1-3 Credits**

Individual study to augment depth of knowledge in area related to course of study. May be repeated for maximum of 6 credits.

**Prerequisite:** consent of instructor.

**MSW 597. Special Topics**  
**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields. May be repeated for unlimited credit under different subtitles.

**Prerequisite:** consent of instructor.

**MSW 599. Graduate Thesis**  
**6 Credits**

Required for thesis option. May be repeated for a maximum of 6 credits. Restricted to MSW students.

**Prerequisite:** consent of instructor.

**Office Location:** CHSS Room 210

**Phone:** (575) 646-2143

**Website:** <http://socialwork.nmsu.edu>

# Social Work - Bachelor of Social Work

The BSW program prepares you for a beginning professional level of generalist social work practice with an understanding and appreciation of the cultural diversity of the Southwest.

To be admitted as a BSW candidate, you must formally apply for admission to the program. A 2.5 grade-point average is required for admission. Consult the pre-social work major advisor, located in the School of Social Work in the College of Health and Social Services. The deadline for submitting applications is the last Friday in January. The program is fully accredited by the Council on Social Work Education and all students have access to copies of the Curriculum Policy Statement.

## General Education Requirements

Students need to complete the New Mexico State University general education requirements before applying to the Bachelor of Social Work program. The School of Social Work requirements include S WK 221G Introduction to Social Welfare and two semesters of a second language. Once accepted into the program, students also need to meet a Cultural Emphasis requirement.

Students may choose one of three tracks to complete a minimum of six credit hours.

1. Take two more semesters of any language.
2. Take an approved language immersion program.
3. Take two approved upper-level courses with a multicultural emphasis (you can get the approved list of courses from your social work advisor).

If the cultural emphasis classes are also Viewing a Wider World classes, you still need to complete the total number of specified upper-division credits necessary for graduation. Highly recommended electives for social work students include courses in sociology, history, Spanish, psychology, family life, child development, English, philosophy, anthropology, computer science, criminal justice, government and economics. Electives must be sufficient to bring total credits to 120, including 52 upper-division credits, for graduation.

## Departmental Requirements

Preparation for entry-level professional social work requires a thorough knowledge of theory and skills; therefore, the high number (57) of core social work credits is required.

Course	Title	Credits
<b>Freshman</b>		
<b>Fall</b>		
ENGL 111G or ENGL 111GH	Rhetoric and Composition or Rhetoric and Composition Honors	4
BIOL 101G	Human Biology <sup>1</sup>	3
BIOL 101GL	Human Biology Laboratory <sup>1</sup>	1
Communications		3
Second Language		3-4
		14-15
<b>Spring</b>		
One from the following:		3
MATH 112G	Fundamentals of Elementary Math II	
MATH 121G	College Algebra	
MATH 142G	Calculus for the Biological and Management Sciences	

MATH 210G	Mathematics Appreciation	
STAT 251G or STAT 271G	Statistics for Business and the Behavioral Sciences or Statistics for Psychological Sciences	3
C EP 110G	Human Growth and Behavior <sup>2</sup>	3
Lab Science		4
Second Language		3-4
S WK 221G	Introduction to Social Welfare <sup>2</sup>	3
Credits		19-20

**Sophomore**

**Fall**

A ST 311 or STAT 251G	Statistical Applications or Statistics for Business and the Behavioral Sciences	3
Humanities/Fine Arts		3
Humanities/Fine Arts		3
Social/Behavioral Science		3
Select one from the following:		3
ENGL 203G	Business and Professional Communication	
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
Credits		15

**Spring**

Viewing a Wider World/C E		3
Viewing a Wider World/C E		3
Elective		3
Elective		3
Credits		12

**Junior**

**Fall**

Select sufficient electives to bring the total number of credits to a minimum of 120 credits.		3
S WK 300	Social Work Practice Skills	3
S WK 309	Sociocultural Concepts	3
S WK 311	Human Behavior and the Social Environment I	3
S WK 331V	Introduction to Social Policy: History	3
Credits		15

**Spring**

Select sufficient electives to bring the total number of credits to a minimum of 120 credits.		3
S WK 312	Human Behavior and the Social Environment II	3
S WK 313	Social Work Practice with Individuals	3
S WK 315	Social Work Practice with Families	3
S WK 316	Social Work Research	3
Credits		15

**Senior**

**Fall**

Select sufficient electives to bring the total number of credits to a minimum of 120 credits.		3
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S WK 401	Field Experience I	3
S WK 412	Practicum Seminar I	3
S WK 415	Generalist Social Work Practice with Organizations and Communities	3
S WK 417	Social Welfare Policy: Legislation	3
Credits		15

**Spring**

Select sufficient electives to bring the total number of credits to a minimum of 120 credits.		3
S WK 403	Social Work Practicum II	3
S WK 416	Generalist Social Work Practice with Groups	3
S WK 418	Professionalism in the Field of Social Work	3
S WK 419	Practicum Seminar II	3
Credits		15
Total Credits		120-122

<sup>1</sup> BIOL 101G Human Biology and BIOL 101GL Human Biology Laboratory: must be completed before starting the S WK program and require a grade of C- or better.

<sup>2</sup> C EP 110G Human Growth and Behavior and S WK 221G Introduction to Social Welfare: must be completed before starting the S WK program and require a grade of C- or better.

*NOTE: Students need to submit a formal application packet to the School of Social Work in January and be accepted into program before they can take junior or senior year courses.*

A grade of C- or better is required for all social work courses.

## Social Work - Master of Social Work

The requirements for the Master of Social Work degree include 60 credits of designated graduate courses (30 credits of designated graduate courses for those accepted for advanced standing); a cumulative grade-point average of at least 3.0 on a 4.0 scale in all course and fieldwork.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

Any social work graduate student who receives an F in a social work course is dismissed from the program and must reapply for admission to the MSW program. Any social work student who receives a D in a social work course must repeat the course. Any social work student who receives 2 D's in social work courses is dismissed from the program and must reapply for admission to the MSW program.

An integral part of a graduate social work program is completing the field practicum. For those enrolled in the two-year and three-year programs, two practicum placements will be required, which result in the student's spending 950 hours in the field. For those students entering the program with advanced standing, one field placement is required, totaling 500 hours in the field. Students are offered a wide range of field settings in New Mexico and West Texas. Students should be prepared to travel some distance and be responsible for their own transportation costs.

## Application Deadlines

The deadline for complete applications is January 26th of each year.

- Late applications that are complete will be considered when received on a space available basis.

## Course of Study

### Full-Time Program (60 credits)

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MSW 509	Sociocultural Concepts and Populations of the Southwest	3
MSW 510	Human Behavior and the Social Environment I	3
MSW 520	Social Work Practice I	3
MSW 549	Generalist Field Practicum A	3
MSW 500 level elective course		3
Credits		15
<b>Spring</b>		
MSW 500	Social Problems and Social Welfare Policy	3
MSW 514	Human Behavior & the Social Environment II	3
MSW 521	Social Work Practice II	3
MSW 560	Social Work Research I	3
MSW 550	Generalist Field Practicum B	3
Credits		15
<b>Second Year</b>		
<b>Fall</b>		
MSW 503	Policy Analysis and Change	3
MSW 524	Practice III: Advanced Practice with Individuals	3
MSW 525	Practice IV: Advanced Generalist Practice with Groups	3
MSW 547	Social Work Mental Health Practice	3
MSW 556	Advanced Generalist Field Practicum A	3
Credits		15
<b>Spring</b>		
MSW 526	Practice V: Advanced Practice with Families	3
MSW 527	Practice VI: Advanced Practice with Organizations and Communities	3
MSW 562	Social Work Research II	3
MSW 557	Advanced Generalist Field Practicum B	3
MSW 500 level elective course		3
Credits		15
Total Credits		60

### Course of Study: Full-Time Advanced Standing (30 credits)

Full-Time Advanced Standing begins in Summer and then follows the Year Two schedule, with the addition of 3 credits MSW or/outside elective in both fall and spring semesters.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MSW 503	Policy Analysis and Change	3
MSW 524	Practice III: Advanced Practice with Individuals	3
MSW 525	Practice IV: Advanced Generalist Practice with Groups	3
MSW 547	Social Work Mental Health Practice	3
MSW 556	Advanced Generalist Field Practicum A	3
Credits		15
<b>Spring</b>		
MSW 526	Practice V: Advanced Practice with Families	3
MSW 527	Practice VI: Advanced Practice with Organizations and Communities	3
MSW 562	Social Work Research II	3
MSW 557	Advanced Generalist Field Practicum B	3
MSW 500 level elective course		3
Credits		15
Total Credits		30

### Course of Study: Part-Time Program (60 credits)

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MSW 509	Sociocultural Concepts and Populations of the Southwest	3
MSW 510	Human Behavior and the Social Environment I	3
MSW 500 level elective course		3
Credits		9
<b>Spring</b>		
MSW 500	Social Problems and Social Welfare Policy	3
MSW 514	Human Behavior & the Social Environment II	3
MSW 560	Social Work Research I	3
Credits		9
<b>Second Year</b>		
<b>Fall</b>		
MSW 503	Policy Analysis and Change	3
MSW 520	Social Work Practice I	3
MSW 549	Generalist Field Practicum A	3
Credits		9
<b>Spring</b>		
MSW 521	Social Work Practice II	3
MSW 550	Generalist Field Practicum B	3

MSW 500 level elective course		3
	Credits	9
<b>Third Year</b>		
<b>Fall</b>		
MSW 524	Practice III: Advanced Practice with Individuals	3
MSW 525	Practice IV: Advanced Generalist Practice with Groups	3
MSW 547	Social Work Mental Health Practice	3
MSW 556	Advanced Generalist Field Practicum A	3
	Credits	12
<b>Spring</b>		
MSW 526	Practice V: Advanced Practice with Families	3
MSW 527	Practice VI: Advanced Practice with Organizations and Communities	3
MSW 562	Social Work Reserach II	3
MSW 557	Advanced Generalist Field Practicum B	3
	Credits	12
	Total Credits	60

## Alcohol and Drug Counseling - Graduate Minor

This minor involves the departments of: Counseling and Educational Psychology; Family and Consumer Science; Nursing; and Social Work. Completion of this minor will prepare students for completion of the coursework necessary to take the exam for state licensure as a drug and alcohol counselor in the State of New Mexico. If you are interested in the minor please request an information sheet from the Graduate Program Coordinator that outlines the program requirements and specify the application process.

### Related Outside Elective Examples (choose one graduate level)

MSW elective courses not listed above, Sociology, Anthropology, Psychology, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, Criminal Justice.

## Master of Social Work/Master of Public Health - Dual Degree

The School of Social Work and the Department of Health Science offer a joint MSW/MPH degree program. The two degrees are:

1. Master of Social Work (MSW) and
2. Master of Public Health (MPH) in Community Health Education.

Students interested in pursuing the joint degree program must:

- Prepare and submit separate admissions applications to both programs
- Notify each program in writing of the intent to complete the joint degree program
- Be officially admitted to both degree programs
- Notify the NMSU Graduate School of the intent to complete the joint degree program
- Complete all course requirements for both degree programs
- Complete separate final examinations for both degree programs

If you are interested in pursuing this option please call and talk to the Graduate Program Coordinator. It is anticipated that students in this program will take three academic years to complete the joint MSW/MPH degree programs.

# UNDERGRADUATE HONORS COLLEGE

Dean - Miriam S. Chaiken

Associate Dean and Director of National Scholarships - Tim Ketelaar

Assistant Dean for Development - Cindy Gwaltney Nicholson

Executive Administrative Assistant - Valerie Torres

Crimson Scholars Coordinator - Roman Gutierrez

Student Programs Coordinator - Abby Nayra

The Honors College is located in the Conroy Honors Center on the corner of University and Espina Avenues. Most honors classes are taught in the Conroy Honors Center.

Phone: (575) 646-2005

Website: <http://honors.nmsu.edu/>

## Mission of the William Conroy Honors College

The mission of the New Mexico State University Honors College is to serve the citizens and state of New Mexico by providing an enriching environment for diverse, academically talented and motivated students. The Honors College also seeks to create a community of scholars and mentors that fosters personal growth, critical thinking, leadership, independence, curiosity and social responsibility. The college aspires to cultivate student potential to broadly understand and positively impact communities, organizations and the larger world. The Honors College aims to focus campus attention on excellence in undergraduate education while strengthening New Mexico State University's reputation as the university of choice in New Mexico.

In support of this mission, the Honors College integrates the following objectives:

- Provide students with an interdisciplinary, intellectually challenging curriculum that integrates active and service-based learning;
- Promote university-wide undergraduate research and experiential opportunities, linking students with faculty mentors;
- Foster faculty enrichment and professional development;
- Encourage, mentor and guide students seeking postgraduate scholarships and fellowships;
- Offer students opportunities for developing leadership skills;
- Create a residential community that combines learning inside and outside the classroom.

In small classes taught by master teachers, students in the Honors College engage in lively discussion and collaborative investigation of interdisciplinary topics. By taking honors courses, students may also work toward completing general education requirements and disciplinary requirements in the major.

Students in the Honors College are 'dual citizens', meaning they enroll in both the college(s) of their major/minor and the Honors College. The Honors College does not offer a degree instead, it offers students

the opportunity to graduate with various levels of honors distinction (described below).

## The Honors Faculty

The Honors College faculty come from academic departments from throughout the university. Members of the faculty are chosen through a rigorous selection process and include many of New Mexico State University's most distinguished teachers and researchers.

**Professors** Alexander, Amato, Boeing, Bosland, Bronstein, Butler, Cleveland, Erickson Fouillade, Hammond, Hamzeh, Harvey, Horodowich, Hubbell, Knapp, Lapid, Lawton, Lodder, Malamud, Manning, Munson-McGee, Olberding, Pratt, Serrano, Shearer, Slaton, Stanford, Storm, Thompson

**Associate Professors** Armfield, Guynn, Hamzeh Al Smadi, Herrera, Keleher, Ketelaar, Lee, Miller-Tomlinson, Morgan, Rourke, Salamaca-Riba, Schirmer

**Assistant Professors** Flores-Carmona, Holt, Jenks, E. Johnson

**College Professors** Fitzsimmons, Gilpin, Masson, McCamley, Rochelle

**Emeritus Professors** Eamon, Ellis, Lapid, Lavender, LaPorte, Ocepek, Townley, Wolf

## Admission to the Honors College

Students admitted to the Honors College are designated as Crimson Scholars, the following eligibility criteria apply:

**Automatic Eligibility.** Entering freshmen are automatically eligible for admission to the Honors College and Crimson Scholars by meeting one of the following criteria:

- composite ACT score of 26 (or 1240 SAT score); or
- high school GPA of 3.75 or higher

**Admission by Petition.** Entering freshmen who have an ACT score of at least 24 (or 1200 SAT score) or a high school GPA of 3.50 may submit a written petition for provisional admission to the Honors College using a form provided by the Honors College office upon the request of the student.

**Transfer and Continuing Students.** Transfer and continuing students who have earned at least 3 college credit hours will be eligible for admission to the college on the basis of a cumulative college GPA that meets eligibility requirements for continuing students (see below).

**Eligibility for Continuing Membership.** The eligibility criteria for continuing membership in the Honors College is the same as for continuing Crimson Scholars status. The requirements are:

- Fewer than 28 hours earned: 3.3 GPA
- More than 28 hours earned: 3.5 GPA

**Appeals.** Students who fall below the designated GPAs and lose their eligibility for Honors College status due to extraordinary circumstances may petition the College Admission Committee for readmission.

## Enrolling in Honors Courses

Students do not have to be members of the Honors College to enroll in honors courses. Any eligible student may enroll. The eligibility requirements to enroll in lower-division honors courses are the same as those pertaining to admission to the college and continuance in the

college. For upper-division courses, the requirement is a cumulative 3.2 GPA. Students lacking these requirements may petition the Honors College Dean for permission on a case-by-case basis.

## Graduating with University Honors

The Honors College offers two program options:

1. Graduation with University Honors and
2. The Honors Certificate.

Each option has separate eligibility requirements, benefits and forms of recognition for the student. Almost all honors courses fulfill university general education requirements. To have these courses count toward one of these programs, a student must earn at least a B.

Any student who attains an overall GPA of 3.5-3.749 and who completes 15 credits of honors coursework and the honors capstone is eligible to graduate with University Honors. Students who attain an average of 3.75 or better and who complete 15 credits of honors coursework and the honors capstone are eligible to graduate with Distinction in University Honors. Transcripts will certify graduation with University Honors or Distinction in University Honors. Students who complete the requirements for graduation with either distinction receive recognition in the commencement program, a Certificate of Distinction, and a medallion upon graduation.

### University Honors Requirements -- Suggested Sequence

#### Freshman-Sophomore Years

Three courses from the Honors Core (lower division)	9
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#### Junior-Senior Years

Two 300- or 400-level Honors courses	6
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Thesis or Capstone Project	3
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Total Credits	18
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## Senior Capstone

In order to graduate from the Honors College with the designation of University Honors or Distinction in University Honors, a student must complete a Capstone. The Capstone is normally completed during the senior year and may be undertaken only if the student meets the eligibility requirements for graduation from the College (3.5 minimum GPA and the required courses). The Capstone carries 3 graded credit hours.

Before beginning the final project, the student must choose a faculty advisor and file with the College a proposal that is approved by the faculty advisor and the Dean of the Honors College. The final project is graded by the faculty advisor, who submits a final grade to the Dean of the Honors College.

Candidates for graduation with University Honors and Distinction in University Honors are expected to make public presentations of their final projects at one or more of the following:

1. the Undergraduate Research and Creative Arts Symposium held every Spring Semester,
2. a department seminar,
3. and/or a seminar sponsored by the Honors College.

The method of presentation shall be that deemed appropriate for the discipline in which the project is undertaken.

The written component of the final project shall be filed with the Honors College in a bound copy according to the guidelines established by the college.

The Senior Capstone may be any one of the following:

**Thesis** — The thesis is an independent scholarly or scientific research project that is undertaken with the advice and direction of a member of the university faculty. The thesis does not need to be on a topic in the student's major field, but must meet the guidelines and protocols of the discipline in which it is written. The student's faculty advisor will review the student's thesis and determine a final grade.

**Creative Arts or Performance Project** — The Senior Creative Arts/ Performance project may take the form of an exhibition, performance, recital or other event deemed appropriate by the faculty advisor and the Dean of the Honors College. In addition to the performance or exhibition, the student must complete a written report or description of the project that is approved by the faculty advisor, to be filed with the Honors College.

**Service Learning Project** — The Service Learning Project shall be undertaken under the auspices and supervision of an agency approved by the Dean of the Honors College and earn Honors internship credits. A faculty advisor must approve the project and monitor its progress. The Service Learning Project must be more than simply a certain number of hours volunteered to an agency. It must also involve a creative and leadership element, such as the design of a program or policy that identifies a problem and meets a specific need of the agency. A time log and journal shall be kept by the student during the course of the project. A written report describing the objective and design of the project, as well as an evaluation of its successes and failures, must be submitted to the Honors College according to norms established by the college. The report must also contain a reflective component, demonstrating increased self-awareness and personal growth.

**Honors Contract** — An Honors Contract is a mechanism for adding an "honors dimension" to a course that is not listed as an honors course (HON prefix). The contract allows honors students to convert a regular non-honors course into an honors course that counts toward graduation with University Honors. The Honor Contract project should add an academic or experiential dimension to the course by introducing new material and/or experiences. Contract form may be downloaded from the Honors College website.

## Community Service Options

The Honors College encourages its students to perform volunteer public service. Under certain circumstances, public service may be used as an alternative to completing some of the requirements for graduation from the Honors College. The following guidelines apply:

During the sophomore, junior or senior year, a student with at least a 3.5 GPA may undertake community service with an agency or organization in Doña Ana County (or an agency outside the area approved by the Honors College Dean) to earn a waiver of up to 3 of the hours required for University Honors (not including the Final Project). A minimum of 15 hours of community service per week, per semester is required for each honors credit hour to be waived. Community service hours must be verified by a supervisor of the agency or organization on a form approved by the Honors College. On-campus activities are not included under this option. The student must also certify that the community service hours are not being used for any course or degree requirement. Approval of the

Dean of the Honors College must be obtained prior to beginning volunteer service to be eligible for this option.

## International Study Option

Students in the Honors College are strongly encouraged to participate in an international experience. An NMSU honors student with at least a 3.5 GPA may earn a waiver of up to 3 credit hours required for University Honors for such international study (not including the Final Project). This waiver will be awarded for college credit earned while participating in any international study program approved by the Honors College or the Office of International Study. One honors hour will be waived for each 3 semester credit hours earned with a grade of 'A', 'B', or 'S'. Permission to use this option must be approved in advance by the Honors College.

Note: Waiver of university honors credit for service learning or international study does not reduce or affect in any way the total number of hours required for graduation. Waiver of honors credit for service learning or international study cannot be applied toward the final project requirement.

## Honors Certificate Program

Sophomores, juniors and seniors with a cumulative grade-point average of 3.2 are eligible for the Honors Certificate Program. A student who completes at least two 300- or 400-level honors seminars will be given a Certificate of Distinction at graduation and special recognition in the commencement program. See the honors Dean for details on available seminars, Honors College, Conroy Honors Center.

## Crimson Scholars Program

The Crimson Scholars Program is a benefits and recognition program for academically superior students who have a cumulative 3.5 GPA and are taking three or more credits per semester. Crimson Scholars receive a number of benefits, including:

- Automatic eligibility for all Honors courses
- Early registration
- Extended library check-out privileges
- Special advising
- The option to live in the Honors Living Learning Community in our residence hall.
- Students who earned at least 75% of their credits from New Mexico State University with Crimson Scholar status<sup>1</sup> at the time of graduation receive a "Crimson Scholar Graduate" notation on their transcript.
- Students who complete 75% of their credits as Crimson hours<sup>1</sup> from New Mexico State University at the time of applying for their degree, receive recognition in the commencement program and are eligible to purchase a Crimson Scholar cord for graduation.
- Students who have maintained Crimson Scholars status for 24 Crimson hours<sup>1</sup> from New Mexico State University earn a Crimson scholar pin.

To be eligible for the Crimson Scholars Program, applicants must be degree seeking.

- Entering freshmen must have either:
  - a minimum ACT standard composite score of 26;
  - a 3.75 or better high school GPA; or
  - a minimum SAT score of 1240; or

- a 3.75 or better high school GPA

- Currently enrolled students must have a minimum cumulative GPA of 3.5 for 75% of the credits<sup>1</sup> at NMSU
- Transfer students must have a 3.5 cumulative GPA from their previous institution(s) or complete 3 or more credits<sup>1</sup> at NMSU for eligibility.

To maintain Crimson Scholar status:

- Freshmen entering on an ACT score must maintain a cumulative GPA of 3.5 and complete three or more credits per semester to continue in the program.
- Sophomores, juniors and seniors must maintain a minimum cumulative GPA of 3.5 and be currently enrolled in a total of 3 or more credits<sup>1</sup> per semester at NMSU or any NMSU community college to retain their Crimson Scholars status.
- Crimson Scholars whose GPA drops below the required cumulative 3.5 or drop below the three credit minimum will be dropped from the program. If in the following semester, the student's cumulative GPA and credits again meet the minimum requirement, the student will *automatically* be reinstated.

In recognition of the student's academic achievement, a statement designating "Crimson Scholar Graduate" is placed on the student's transcript after completion of 75% of credits earned at NMSU as Crimson hours<sup>1</sup> at the time of graduation and a minimum cumulative GPA of 3.5.

To be designated in the commencement program as a Crimson Scholar graduate, a student must complete a minimum 75% of credits earned at NMSU as Crimson hours<sup>1</sup> at the time of applying for their degree. Crimson Scholars receive recognition in the commencement program and are eligible to purchase a Crimson Scholar cord for graduation. Students who complete 24 Crimson hours<sup>1</sup> from New Mexico State University earn a Crimson Scholar pin. Crimson Scholars are entitled to early registration and library privileges. Additional information is available from the Crimson Scholars Office, located in the Conroy Honors Center.

*NOTE: Crimson Scholars interested in work-study positions must submit a yearly Free Application for Federal Student Aid (FAFSA) and complete a financial aid file with the NMSU Office of Financial Aid.*

<sup>1</sup> does not include I or audit course designations at NMSU

## The Honors Living and Learning Community (HLLC)

The New Mexico State University Honors Living and Learning Community (HLLC) is an educational initiative that links in-class and out-of-class learning experiences for honors students. The goals of the Honors Living and Learning Community are to:

1. supplement classroom learning experiences with co-curricular programming;
2. foster the development of an honors community that includes honors students, faculty, and staff; and
3. create a supportive environment for honors students.

Above all, the Honors Living and Learning Community aims to develop a small-college environment within the context of a large research university, thus giving students the benefits of both. Honors students, especially first-year students, are encouraged to take advantage of

this special opportunity. The Honors Living and Learning Community is comprised of three components:

The Conroy Honors Center — is the academic home of the Honors College. This historic building was designed by the renowned southwestern architect Henry C. Trost and built in 1907 to house the campus chapter of the YMCA. The Conroy Center houses the administrative offices of the program along with three seminar rooms, a student commons area, a kitchen and a computer lab.

The Honors Residence Hall — is the focus of NMSU's vibrant honors community. It is a place where honors students live among a community of excellent students with outstanding academic records and who are interested in getting the most out of the academic opportunities offered to them at a large research institution. It also hosts many social and extracurricular academic activities.

The Honors Residence Hall is equipped with a electronic classroom, where some introductory honors courses are taught. The honors faculty participate in residence hall programming and frequently attend residence hall floor meetings with students. The Honors Residence Hall is open to both men and women of any university class standing.

**Honors College information:**

Honors College, MSC 3HON  
New Mexico State University  
P O Box 30001  
Las Cruces, NM 88003-8001  
Phone: (575) 646-2005  
or Dean Miriam Chaiken at [mchaiken@nmsu.edu](mailto:mchaiken@nmsu.edu)

**Crimson Scholars Program information:**

Roman Gutierrez, Coordinator  
Crimson Scholars Program, MSC 3HON  
New Mexico State University  
P O Box 30001  
Las Cruces, NM 88003-8001  
  
Phone: (575) 646-2542  
or Roman Gutierrez at [rgtz129@nmsu.edu](mailto:rgtz129@nmsu.edu)

# THE NMSU COMMUNITY COLLEGES

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Chancellor • *Dan Arvizu*

President NMSU- Las Cruces • *John Floros*

Associate Vice President and Deputy Provost • *Greg Fant*

President NMSU-Alamogordo • *Kenneth Van Winkle*

President NMSU-Carlsbad • *John Gratton*

President NMSU-Doña Ana • *Renay Scott*

President NMSU-Grants • *Mickey Best*

NMSU's Community College campuses make two years of college education available to students in their home environment. The community colleges provide a high quality program of education for all full-time and part-time students; provide occupational education; and provide noncredit community education courses.

A student attending any NMSU Community College campus is enrolled as a New Mexico State University student and may change campuses without completing additional admission procedures.

## Associate Degree Graduation Requirements

Associate degree programs are offered at the NMSU Community College campuses for those desiring specialized training for employment. Community, junior, and technical college transfer students may be admitted and classified on the basis of acceptable credits at two-year institutions. The Associate in prebusiness degree, administered by the College of Business, is available to NMSU Community College campus students completing the requirements as outlined in the "College of Business" section of this catalog. Most courses required for the Associate in Applied Science degree with options in electronics technology offered at the Carlsbad, Grants and Alamogordo campuses meet lower division requirements for the baccalaureate degree program in Electronics Engineering Technology, which is offered on the Las Cruces campus through the College of Engineering.

Math requirements in associate degree and certificate programs vary. ENGL 111G and all developmental studies courses in English, math and reading must be completed with a grade of C- or better. Please refer to your NMSU Community College campus catalog for details. The last 15 semester credits for an associate degree must be taken in residence at NMSU or one of the NMSU Community Colleges. Degree requirements remain in effect for six years. The designation, Meritorious Graduate, is awarded to the top 15 percent of the students receiving associate degrees within each college in any one academic year, provided 45 or more credits have been completed at NMSU and/or a NMSU Community College with computable grades.

## Certificate Programs

In addition to the regular degree programs offered by the NMSU Community College campuses, certificate programs are available. Students should contact the NMSU Community College campus for information on available certificate programs.

## NMSU Community College Campus Information

Information concerning NMSU Community College campus programs, class schedules, catalogs, registration and other data may be obtained from the NMSU Community College campus administration.

### **Kenneth Van Winkle, President NMSU-Alamogordo Community College**

2400 N. Scenic Dr.  
Alamogordo, New Mexico 88310  
Alamogordo Course Catalog  
(575) 439-3696

### **John Gratton, President NMSU-Carlsbad Community College**

1500 University Drive  
Carlsbad, New Mexico 88220  
Carlsbad Course Catalog  
(575) 234-9210

### **Renay Scott, President NMSU-Doña Ana Community College**

Box 30001, Dept. 3DA  
Las Cruces, New Mexico 88003  
Dona Ana Course Catalog  
(575) 527-7510

### **Mickey Best, President NMSU-Grants Community College**

1500 Third Street  
Grants, New Mexico 87020  
Grants Course Catalog  
(505) 287-6678

# COURSE LISTINGS

Courses are titled in the following style:

ASTR 110G Introduction to Astronomy (4 cr. (3+3P))

- Course number- (110) indicates the course is a freshman course.
- Suffix (G)- indicates a New Mexico Common Core course.
- Suffix (V)- indicates a Viewing a Wider World course.
- Suffix (H)- indicates a Honors courses outside of the Honors prefix.
- Suffix (L)- indicates a Laboratory course.
- Suffix (M)- indicates a Multicultural course.
- Credits - The unit of university credit is the semester hour, which is the equivalent of one hour's recitation or a minimum of two hours of practice per week for one semester. The (3+3P) means that the class meets for 150 minutes per week for lecture and also requires 150 minutes per week of "laboratory" (practice, field work, or recitation).

## Course Number Designation

- 100-199 – Freshman courses
- 200-299 – Sophomore courses
- 300-399 – Junior courses
- 400-499 – Senior courses
- 450-499 – Senior or graduate courses
- 500-599 – First-year graduate courses
- 600-699 – Advanced graduate courses
- 700 – Ph.D. dissertation

In order to register for 300-level courses, a student must have met the basic academic skills requirements.

The letter N will be added as a suffix to the course number when the course credits are not applicable to the baccalaureate and specified associate degrees.

## A

- A E-AEROSPACE ENGINEERING (A E) (p. 679)
- A EN-AGRICULTURAL ENGINEERING (A EN) (p. 680)
- A S-ARTS AND SCIENCES (A S) (p. 680)
- A ST- APPLIED STATISTICS (A ST) (p. 681)
- ACCT-ACCOUNTING (ACCT) (p. 682)
- ACES-AGRI, CONSUMER & ENV SCIE (ACES) (p. 684)
- AEEC-AGRICULTURAL ECON/ECON (AEEC) (p. 685)
- AERO-AEROSPACE STUDIES (AERO) (p. 686)
- AERT-AEROSPACE TECHNOLOGY (AERT) (p. 687)
- AG E-AGRICULTURAL ECONOMICS (AG E) (p. 688)
- AGRO-AGRONOMY (AGRO) (p. 690)
- AHS-ALLIED HEALTH SCIENCE (AHS) (p. 692)
- ANSC-ANIMAL SCIENCE (ANSC) (p. 693)
- ANTH-ANTHROPOLOGY (ANTH) (p. 698)
- ARCT-ARCHITECTURE (ARCT) (p. 704)
- ART-ART (ART) (p. 706)
- ASTR-ASTRONOMY (ASTR) (p. 713)
- AUTO-AUTOMOTIVE TECHNOLOGY (AUTO) (p. 715)
- AXED-AGRICULTURAL EXTN EDUC (AXED) (p. 717)

## B

- B A-BUSINESS ADMINISTRATION (B A) (p. 721)
- BCHE-BIOCHEMISTRY (BCHE) (p. 722)
- BCIS-BUSINESS COMPUTER SYSTEMS (BCIS) (p. 723)
- BCT-BUILDING CONSTRUCTION TECH (BCT) (p. 725)
- BIL-BILINGUAL EDUCATION (BIL) (p. 726)
- BIOL-BIOLOGY (BIOL) (p. 727)
- BLAW-BUSINESS LAW (BLAW) (p. 734)
- BMGT-BUSINESS MANAGEMENT (BMGT) (p. 735)
- BOT-BUSINESS OFFICE TECHNOLOGY (BOT) (p. 737)
- BUSA-BUSINESS ADMINISTRATION (BUSA) (p. 740)

## C

- C D-COMMUNICATION DISORDERS (C D) (p. 740)
- C E-CIVIL ENGINEERING (C E) (p. 743)
- C EP-COUNSELING & EDUC PSY (C EP) (p. 747)
- C J-CRIMINAL JUSTICE (C J) (p. 754)
- C S-COMPUTER SCIENCE (C S) (p. 759)
- CAST-CHILD ADVOCACY STUDIES (CAST) (p. 766)
- CCDE-DEVELOPMENTAL ENGLISH (CCDE) (p. 767)
- CCDL-DEVELOPMENTAL ESL (CCDL) (p. 767)
- CCDM-DEVELOPMENTAL MATHEMATICS (CCDM) (p. 767)
- CCDD-DEVELOPMENTAL READING (CCDD) (p. 767)
- CCDS-DEVELOPMENTAL SKILLS (CCDS) (p. 768)
- CHEF-CULINARY ARTS (CHEF) (p. 768)
- CHEM-CHEMISTRY (CHEM) (p. 770)
- CHIN-CHINESE (CHIN) (p. 773)
- CHME-CHEMICAL & MATERIALS ENGR (CHME) (p. 773)
- CHSS - COMM HEALTH/SOC SRVCS (CHSS) (p. 779)
- CMI - CINEMA & FILM/VIDEO PROD (CMI) (p. 779)
- CMT-CREATIVE MEDIA TECHNOLOGY (CMT) (p. 784)
- COLL-COLLEGE (COLL) (p. 788)
- COMM-COMMUNICATION (COMM) (p. 789)
- CSEC-CYBERSECURITY (CSEC) (p. 792)
- CTFM-CLTHNG/TXTLS/FSHN MRCHDSG (CTFM) (p. 792)

## D

- DANC-DANCE (DANC) (p. 793)
- DAS-DENTAL ASSISTING (DAS) (p. 799)
- DHYG-DENTAL HYGIENE/HYGIENIST (DHYG) (p. 800)
- DMS-DIAGNOSTIC MED SONOGRAPHY (DMS) (p. 802)
- DRFT-DRAFTING (DRFT) (p. 804)

## E

- E E-ELECTRICAL ENGINEERING (E E) (p. 807)
- E S-ENVIRONMENTAL SCIENCE (E S) (p. 814)
- E T-ENGINEERING TECHNOLOGY (E T) (p. 815)
- ECDV-ECONOMIC DEVELOPMENT (ECDV) (p. 821)
- ECED-EARLY CHILDHOOD EDUCATION (ECED) (p. 822)
- ECON-ECONOMICS (ECON) (p. 825)
- EDLT-EDUCATION (EDLT) (p. 827)
- EDUC-EDUCATION (EDUC) (p. 828)

- ELA - EDUC LEADERSHIP & ADMIN (ELA) (p. 833)
- ELT - ELECTRONICS TECHNOLOGY (ELT) (p. 837)
- ENGL-ENGLISH (ENGL) (p. 838)
- ENGR-ENGINEERING (ENGR) (p. 847)
- ENTR-ENTREPRENEURSHIP AND INNOVATION (p. 848)
- ENVE-ENVIRONMENTAL ENGINEERING (ENVE) (p. 848)
- EPWS-ETMLGY/PLNT PTHLGY/WD SCI (EPWS) (p. 849)

## F

- FCS-FAMILY AND CHILD SCIENCE (FCS) (p. 851)
- FCSC-FAMILY & CONSUMER SCI (FCSC) (p. 853)
- FCSE-FAMILY & CONSUMER SCI EDU (FCSE) (p. 853)
- FIN-FINANCE (FIN) (p. 854)
- FIRE-FIRE INVESTIGATION (FIRE) (p. 856)
- FREN-FRENCH (FREN) (p. 858)
- FRMG-FAMILY RESOURCE MGT (FRMG) (p. 859)
- FSTE-FOOD SCIENCE & TECHNOLOGY (FSTE) (p. 860)
- FWCE-FISH,WILDLF,CONSERV ECOL (FWCE) (p. 861)

## G

- G S-GRADUATE STUDIES (G S) (p. 864)
- GENE-GENETICS (GENE) (p. 864)
- GEOG-GEOGRAPHY (GEOG) (p. 865)
- GEOL-GEOLOGY (GEOL) (p. 869)
- GER-GERMAN (GER) (p. 871)
- GERO-GERONTOLOGY (GERO) (p. 872)
- GOVT-GOVERNMENT (GOVT) (p. 872)
- GPHY-GEOPHYSICS (GPHY) (p. 877)
- GRAD CROSS UNIV EXCH (GREX) (p. 877)

## H

- HIST-HISTORY (HIST) (p. 877)
- HIT-HEALTH INFO TECHNOLOGY (HIT) (p. 885)
- HNDS-HUMAN NUTRITION & DIET (HNDS) (p. 886)
- HON-HONORS (HON) (p. 889)
- HORT-HORTICULTURE (HORT) (p. 893)
- HOST-HOSPITALITY AND TOURISM (HOST) (p. 896)
- HRTM-HOTEL/RESTRNT/TOURISM MGT (HRTM) (p. 897)
- HVAC-HEATING/AC/REFRIGERATION (HVAC) (p. 900)

## I

- I B-INTERNATIONAL BUSINESS (I B) (p. 900)
- I E-INDUSTRIAL ENGINEERING (I E) (p. 901)
- ICT-INFO & COMMUNICATION TECH (ICT) (p. 904)
- INMT - INDUSTRIAL MAINTENANCE (INMT) (p. 905)
- INTR-INTERDISCIPLINARY STUDIES (p. 906)

## J

- JOUR-JOURNALISM (JOUR) (p. 906)
- JPNS-JAPANESE (JPNS) (p. 908)

## L

- L SC-LIBRARY SCIENCE (L SC) (p. 908)

- LANG-LANGUAGE (LANG) (p. 911)
- LAWE-LAW ENFORCEMENT (LAWE) (p. 911)
- LIB-LIBRARY SCIENCE (LIB) (p. 912)
- LING-LINGUISTICS (LING) (p. 912)

## M

- M E-MECHANICAL ENGINEERING (M E) (p. 912)
- M SC-MILITARY SCIENCE (M SC) (p. 916)
- MAT-AUTOMATION & MANUFACTURING (MAT) (p. 918)
- MATH-MATHEMATICS (MATH) (p. 919)
- MGT-MANAGEMENT (MGT) (p. 924)
- MKTG-MARKETING (MKTG) (p. 927)
- MOLB-MOLECULAR BIOLOGY (MOLB) (p. 929)
- MPH-MASTER OF PUBLIC HEALTH (MPH) (p. 930)
- MSW-SOCIAL WORK (MASTERS) (MSW) (p. 932)
- MUS-MUSIC (MUS) (p. 934)

## N

- NA - NURSING ASSISTANT (NA) (p. 941)
- NAV-NAVAJO (NAV) (p. 943)
- NURS-NURSING (NURS) (p. 943)

## O

- OEEM-BIOMEDICAL TECHNOLOGY (OEEM) (p. 955)
- OECS-COMPUTER TECHNOLOGY (OECS) (p. 955)
- OEEM- PARAMEDIC (OEEM) (p. 958)
- OEET- ELECTRICAL TRADES (OEET) (p. 961)
- OEGR-DIGITAL GRAPHIC TECH (OEGR) (p. 962)
- OEES-GEOGRAPHIC INFO SYS (OEES) (p. 962)
- OEPS-PUBLIC SAFETY (OEPS) (p. 962)
- OEPT-PHOTOGRAPHIC TRADES (OEPT) (p. 962)
- OETS-TECHNICAL STUDIES (OETS) (p. 963)

## P

- P E-PHYSICAL EDUCATION (P E) (p. 963)
- PE-P-PHYSICAL EDUCATION (PE P) (p. 965)
- PHIL-PHILOSOPHY (PHIL) (p. 966)
- PHLS-PUBLIC HEALTH SCIENCES (PHLS) (p. 967)
- PHYS-PHYSICS (PHYS) (p. 970)
- PL-S-PARALEGAL SERVICES (PL S) (p. 975)
- PORT-PORTUGUESE (PORT) (p. 976)
- PSY-PSYCHOLOGY (PSY) (p. 976)

## R

- RADT-RADIOLOGIC TECHNOLOGY (RADT) (p. 979)
- RDG-READING (RDG) (p. 980)
- RESP - RESPIRATORY THERAPY (RESP) (p. 982)
- RGSC-RANGE SCIENCE (RGSC) (p. 983)
- RXPP-PRESCRIP PRIV PRAC PSYCH (RXPP) (p. 985)

## S

- S WK-SOCIAL WORK (S WK) (p. 987)
- SMET-SCIENCE/MATH/ENG/TECH (SMET) (p. 989)

- SOC-SOCIOLOGY (SOC) (p. 989)
- SOIL-SOIL (SOIL) (p. 993)
- SP M-SPORTS MEDICINE (SP M) (p. 995)
- SPAN-SPANISH (SPAN) (p. 1000)
- SPCD-ENGLISH AS A SECOND LNG (SPCD) (p. 1004)
- SPED-SPECIAL EDUCATION (SPED) (p. 1004)
- STAT-STATISTICS (STAT) (p. 1011)
- SUR-SURVEYING (SUR) (p. 1012)
- SURG-SURGICAL TECHNOLOGY (SURG) (p. 1013)

## T

- TCEN-ENVIRONMENTAL/ENERGY TECH (TCEN) (p. 1014)
- THTR-THEATRE (THTR) (p. 1016)
- TOX-TOXICOLOGY (TOX) (p. 1019)

## U

- UNIV-UNIVERSITY STUDIES (UNIV) (p. 1020)

## W

- W S-WOMEN'S STUDIES (W S) (p. 1020)
- WATR-WATER UTILITIES (WATR) (p. 1023)
- WELD-WELDING TECHNOLOGY (WELD) (p. 1024)
- WERC-WASTE MGT EDU/RSRCH CONS (WERC) (p. 1026)
- WSAM-WATER SCIENCE & MGT (WSAM) (p. 1026)

# A E-AEROSPACE ENGINEERING (A E)

## A E 102. Introduction to Aerospace Engineering

### 1 Credit

A survey course of aeronautical, aerospace, and astronautical engineering, with an emphasis on basic aerospace concepts and major aerospace principles without going into detailed math and analysis. Students are given the opportunity to listen to guest speakers and participate in projects utilizing the NMSU Ultralight and NMSU wind tunnel. Restricted to: Main campus only.

## A E 339. Aerodynamics I

### 3 Credits

Fluid properties, conservation equations, incompressible 2-dimensional flow; Bernoulli's equation; similarity parameters; subsonic aerodynamics: lift and drag, analysis and design of airfoils. May be repeated up to 3 credits. Restricted to: A E majors.

**Prerequisite(s):** M E 234 or M E 237 and M E 228 or MATH 392.

## A E 362. Orbital Mechanics

### 3 Credits

Dynamics of exoatmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories. May be repeated up to 3 credits.

**Prerequisite(s):** M E 228 or MATH 392, M E 234 or M E 237, and M E 261.

## A E 363. Aerospace Structures

### 3 Credits

Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques. Prerequisites: C E 301

## A E 364. Flight Dynamics and Controls

### 3 Credits

Fundamentals of airplane flight dynamics, static trim, and stability; spacecraft and missile six degree of freedom dynamics; attitude control of spacecraft. May be repeated up to 3 credits.

**Prerequisite(s):** M E 228 or MATH 392, M E 234 or M E 237, and M E 261.

## A E 400. Undergraduate Research

### 1-3 Credits (1-3)

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite(s):** Consent of faculty member.

## A E 405. Special Topics

### 3 Credits

Topics of modern interest to be offered by the departmental staff. Consent of instructor required.

## A E 419. Propulsion

### 3 Credits

Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. Prerequisites: A E 439

## A E 424. Aerospace Systems Engineering

### 3 Credits

Basic principles of top down systems engineering and current practice; preliminary and detailed design of aircraft and space vehicles, including requirement, subsystem interaction, and integration, tradeoffs, constraints and non-technical aspects.

**Prerequisite(s):** A E 362.

## A E 428. Aerospace Capstone Design

### 3 Credits

Team Project-analysis, design, hands-on build test, evaluate.

**Prerequisite(s)/Corequisite(s):** A E 447. Prerequisite(s): A E 363 and A E 424.

## A E 439. Aerodynamics II

### 3 Credits

Principles of compressible flow, momentum and energy conservation; thermal properties of fluids; supersonic flow and shock waves; basics of supersonic aerodynamics.

**Prerequisite(s):** A E 339, M E 240, and M E 328.

## A E 447. Aerofluids Laboratory

### 3 Credits (2+3P)

Use of subsonic wind tunnels and other flow to study basic flow phenomena and methods of fluid measurement and visualization.

**Prerequisite(s)/Corequisite(s):** A E 439. Prerequisite(s): M E 345.

## A E 451. Aircraft Design

### 3 Credits

Conceptual design of aircraft based on existing designs, empirical relationships, and theory. Dimensioning, structural design, and performance analysis of major subcomponents such as fuselage, wing, and propulsion system. Static stability and control analysis.

**Prerequisite(s):** A E 339 and A E 363.

## A E 464. Advanced Flight Dynamics and Controls

### 3 Credits

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile/rocket control systems, and guidance systems.

**Prerequisite(s):** A E 364 or consent of instructor.

**A E 509. Individualized Study****3 Credits**

Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to A E & M E majors.

**A E 510. Special Topics****1-6 Credits (1-6)**

Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.

**A E 527. Control of Mechanical Systems****3 Credits**

Rigorous introduction to the control of dynamical systems, with a focus on mechanical systems. Includes basic systems theory, controllability, feedback and stabilization, observers and dynamic feedback, and applications of methods to systems of importance in mechanical engineering. Consent of instructor required. Cross-listed with: M E 527

**A E 529. Nonlinear and Optimal Control****3 Credits**

Introduction to optimal control theory, Pontryagin's Maximum Principle, control of simple mechanical systems, Lagrangian and Hamiltonian methods, introduction to geometric control-Lie algebras, distributions, controllability and observability. Cross-listed with: M E 529

**A E 552. Introduction to Gasdynamics****3 Credits**

Gas kinetics, rarefied gas dynamics, collision dynamics; velocity distribution function, finite rate chemical process; thermal nonequilibrium and chemically reacting flows; introduction to quantum and statistical mechanics; Boltzmann equation and the BGK model; moments of the Boltzmann Equation; the Navier-Stokes Equation; the structure of shock waves.

**A E 562. Astrodynamics****3 Credits**

Two-body problem, orbit analysis, and classical orbit determination methods; trajectory design and optimization; orbital maneuvers using impulsive or continuous thrust; relative motion and rendezvous; perturbations and Lagrange planetary equations; interplanetary mission design including gravity assists; introduction to the three-body problem, halo orbits, and invariant manifolds in mission design.

**A E 564. Advanced Flight Dynamics and Controls****3 Credits**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile / rocket control systems, and guidance systems May be repeated up to 3 credits.

**Prerequisite(s):** A E 364 or consent of instructor.

**A E 598. Special Research Programs****1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to A E & M E majors.

**A E 599. Master's Thesis****15 Credits (15)**

Thesis. Graded: Thesis/Dissertation.

**A E 600. Doctoral Research****1-15 Credits (1-15)**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Dissertation.

**A E 700. Doctoral Dissertation****15 Credits (15)**

Dissertation. Graded: Thesis/Dissertation.

## A EN-AGRICULTURAL ENGINEERING (A EN)

**A EN 459. Design of Water Wells/Pumping Systems****3 Credits**

Design of water wells; selection and specification of pumps and power units.

**Prerequisite:** C E 382.

**A EN 478. Irrigation and Drainage Engineering****3 Credits (2+3P)**

Design and operation of surface and sprinkler irrigation systems; pumping and conveyances; introduction to principles and practices of drainage systems and wells.

**Prerequisite:** C E 382 or consent of instructor.

**A EN 498. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

## A S-ARTS AND SCIENCES (A S)

**A S 100. Insights: University Experience for Future Careers****1 Credit**

Research and investigation of college majors and career opportunities.

**A S 101. Success Seminar****1 Credit**

Academic and personal strategies and campus resources to enhance scholastic achievement. May be repeated up to 1 credits.

**A S 103. Quantitative Foundations****3 Credits**

Course is designed to prepare students for College level mathematics. Initial assessments generate individualized paths to mastery of fundamental skills. Course also covers strategies and campus resources to enhance scholastic achievement. Traditional Grading with RR. May be repeated up to 6 credits. Traditional Grading with RR. Restricted to Las Cruces campus only.

**A S 200. Interdisciplinary Topics****1-4 Credits**

An interdisciplinary approach to subject matter cutting across departmental fields. Specific subjects to be announced in the Schedule of Classes.

**A S 300. Interdisciplinary Topics****1-3 Credits**

An interdisciplinary approach to subject matter cutting across departmental fields. Specific subjects to be announced in the Schedule of Classes. Graded S/U.

**A S 305. Prehealth Internship****1-3 Credits**

Placement with an office of a health professional. May be repeated for a maximum of 3 credits. Student must be registered with the Prehealth Advisory Committee and must have a minimum of 15 credits completed at NMSU. Consent of instructor required. Graded: S/U.

**Prerequisite(s):** Minimum junior standing, 2.5 GPA.

**A S 350. Faculty Led International Travel****1-3 Credits (1-3)**

This is an intensive Faculty Led International Program and earns an additional credit(s) for participation the FLiP. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** Students need to be enrolled or have taken the course related to the Faculty Led International Program.

**A S 450. Discovery Scholars Program Outreach****2-3 Credits (1+3-6P)**

The College of Arts & Sciences sponsors undergraduate research through the Discovery Scholars Program (DSP). In the DSP Outreach program, NMSU students interact with K-12 students in local schools in a variety of ways to enhance learning, inspire K-12 students to go to college, and build bridges between K-12 schools and the College. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**A S 451. Discovery Scholars Program Internships****2-3 Credits (2-3+6-9P)**

The College of Arts & Sciences sponsors undergraduate research through the Discovery Scholars Program (DSP). In the DSP Internship Program, students earn upper-division credit while working as interns in a variety of settings, including research, business, and government. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**A S 480. Topics in Pharmacy****12-18 Credits (12-18)**

This course accepts the transfer of credits from the University of New Mexico College of Pharmacy to New Mexico State University for students who are participants in the UNM/NMSU Pre-Pharmacy Cooperative Program. May be repeated up to 18 credits.

**A S 490. Advanced Topics in Pharmacy****12-18 Credits (12-18)**

This course accepts the transfer of credits from the University of New Mexico College of Pharmacy to New Mexico State University for students who are participants in the UNM/NMSU Pre-Pharmacy Cooperative Program. May be repeated up to 18 credits. Restricted to: UNM/NMSU Cooperative Pharmacy Program. majors.

## A ST- APPLIED STATISTICS (A ST)

**A ST 251G. Statistics for Business and the Behavioral Sciences****3 Credits**

Techniques for describing and analyzing data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. Same as STAT 251G.

**Prerequisite:** C- or better in MATH 120.

**A ST 311. Statistical Applications****3 Credits**

Techniques for describing and analyzing economic and biological data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference.

**Prerequisite(s):** MATH 120.

**A ST 450. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**A ST 456. Statistical Methods and Data Analysis****3 Credits**

Methods for sampling and estimation; analysis of variance and elementary experimental designs; linear regression and correlation; multiple regression, variable selection methods and residual analysis; introduction to statistical packages.

**Prerequisite(s):** A ST 251, A ST 311, or equivalent.

**A ST 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.

**A ST 503. SAS Basics****2 Credits (1+2P)**

An introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily PC/SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures.

**Corequisite(s):** A ST 505, or consent of instructor.

**A ST 504. Statistical Software Applications****1 Credit**

Optional Computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506.

**Prerequisite(s):** A ST 503 or consent of instructor.

**Corequisite(s):** A ST 506.

**A ST 505. Statistical Inference I****4 Credits (3+2P)**

A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z, t, x<sup>2</sup>, F), estimation, and testing. One-way analysis of variance. Simple linear regression.

**Prerequisite:** consent of the instructor.

**A ST 506. Statistical Inference II****3 Credits (2+2P)**

Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots.

**Prerequisite:** A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.

**A ST 507. Advanced Regression****3 Credits**

Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models.

**Prerequisites:** A ST 503 and A ST 505 or consent of instructor.

**A ST 508. Analysis of Advanced Designs and Related Topics****3 Credits**

Complete and incomplete block designs; fixed, mixed, and random models; unbalanced data; analysis of covariance; nested experiments; fractional factorials.

**Prerequisite(s):** A ST 503 and A ST 506; or consent of instructor.

**A ST 515. Statistical Analysis with R****3 Credits**

Introduction to R data types, basic calculations and programming, data input and manipulation, one and two sample tests, ANOVA, regression, diagnostics, graphics, probability distributions, and basic simulations in the R software environment.

**Prerequisite(s):** A ST 505 or equivalent with consent of instructor.

**A ST 521. Sampling Methodology****3 Credits (3+2P)**

Methodology of sampling finite populations using design-based (simple random, stratified, systematic, cluster, and multistage), model-based (regression and ratio estimators), and adaptive sampling. Properties of estimators under all designs are discussed.

**Prerequisite(s):** Either A ST 505 or A ST 565, or consent of instructor.

**A ST 523. Biological Sampling (s)****3 Credits**

Methods of sampling biological populations: area frame, quadrant, line intercept, line transect, and mark-recapture. May be repeated up to 3 credits.

**Prerequisite(s):** A ST 505 or consent of instructor.

**A ST 545. Time Series Analysis and Applications****3 Credits**

A systematic exposition of the methods for analyzing, modeling, and forecasting time series. Emphasizes underlying ideas and methods rather than detailed mathematical derivations, using SAS, BMDP, IMSL, and Fortran. May be repeated up to 3 credits.

**Prerequisite(s):** A ST 503 and A ST 505, or consent of instructor.

**A ST 550. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**A ST 551. Introduction to Statistical Consulting****1 Credit**

Consideration of published material in the consulting process. Restricted to majors. Graded S/U.

**Prerequisite:** consent of instructor.

**A ST 552. Advanced Statistical Consulting****1 Credit**

Continuation of A ST 551 with emphasis on dealing with clients in order to identify statistically relevant features of a research study. Restricted to majors. Graded S/U.

**Prerequisite:** A ST 551.

**A ST 553. Practicum in Statistical Consulting****1 Credit**

Supervised experience under the guidance of senior faculty. May be repeated for a maximum of 2 credits. Restricted to majors. Graded S/U.

**Prerequisite:** A ST 552.

**A ST 555. Applied Multivariate Analysis****3 Credits**

Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques.

**Prerequisite(s):** A ST 506 and A ST 504 or consent of instructor.

**A ST 565. Statistical Analysis I****4 Credits (3+2P)**

An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions ( $z$ ,  $t$ ,  $x^2$ ,  $F$ ), estimation, testing, and simulation.

**Prerequisite:** MATH 291G or consent of instructor.

**A ST 566. Statistical Analysis II****4 Credits (3+2P)**

Continuation of A ST 565.

**Prerequisite:** A ST 565 or consent of instructor.

**A ST 567. Applied Linear Models I****3 Credits**

The mean model, including constraints, approach to linear models; nonidentity variance-covariance matrices. Some emphasis on computational aspects and relation to statistical packages.

**Prerequisite:** A ST 566 or consent of instructor.

**A ST 568. Applied Linear Models II****3 Credits**

The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects.

**Prerequisite:** A ST 567.

**A ST 596. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval by department head. May be repeated for a maximum of 3 credits.

**Prerequisite:** consent of instructor.

**A ST 598. Special Research Problems****1-6 Credits**

Individual analytical or experimental projects. Restricted to majors. Graded S/U.

**A ST 599. Master's Thesis****1-6 Credits**

Thesis.

## ACCT-ACCOUNTING (ACCT)

**ACCT 101. Supplemental Instruction to ACCT 221****1 Credit**

Collaborative workshop for students in ACCT 221 – Financial Accounting. Course does not count toward departmental degree requirements. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**Corequisite(s):** ACCT 221.

**ACCT 200. A Survey of Accounting****3 Credits**

Emphasis on financial statement interpretation and development of accounting information for management. For engineering, computer science, and other non business majors. Community Colleges only.

**Prerequisite:** one C S course or consent of instructor.

**ACCT 221. Principles of Accounting I (Financial)****3 Credits**

An introduction to financial accounting concepts emphasizing the analysis of business transactions in accordance with generally accepted accounting principles (GAAP), the effect of these transactions on the financial statements, financial analysis, and the interrelationships of the financial statements.

**ACCT 222. Principles of Accounting II (Managerial)****3 Credits**

An introduction to the use of accounting information in the management decision making processes of planning, implementing, and controlling business activities. In addition, the course will discuss the accumulation and classification of costs as well as demonstrate the difference between costing systems.

**Prerequisite(s):** ACCT 221.

**ACCT 301. Financial Accounting I****3 Credits**

Concepts, principles, and practices of financial accounting, stressing the determination of income and financial position. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

**Prerequisite(s):** C or better in ACCT 221 and ACCT 222.

**ACCT 302. Financial Accounting II****3 Credits**

A continuation of ACCT 301.

**Prerequisite(s):** C- or better in ACCT 301.

**ACCT 351. Accounting Systems****3 Credits**

Covers accounting information systems as processors of data for financial reporting and control of economic organizations.

**Prerequisite(s):** ACCT 221 and ACCT 222.

**ACCT 353. Cost Accounting****3 Credits**

The development and use of cost accounting information for inventory valuation, income determination, and cost control. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

**Prerequisite(s):** C or better in both ACCT 221 and ACCT 222.

**ACCT 403. Federal Taxation I****3 Credits**

Basic federal income tax laws; emphasis on determination of taxable income of individuals. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

**Prerequisite(s):** A "C" or better in ACCT 221 and ACCT 222.

**ACCT 451. Auditing Theory and Practices****3 Credits**

Auditing standards, audit evidence, auditors reports and opinions, and professional responsibilities.

**Prerequisite(s):** ACCT 351 and C- or better in ACCT 302.

**ACCT 455. Federal Taxation II****3 Credits**

Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning.

**Prerequisite(s):** C- or better in ACCT 403 or consent of instructor.

**ACCT 456. Accounting for Nonprofit Organizations****3 Credits**

Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports.

**Prerequisite(s):** C- or better in ACCT 302.

**ACCT 460. Fraud Examination and Prevention****3 Credits**

Covers business fraud as it is occurring in American society. Emphasis is on occupational fraud and financial statement fraud. Examines various types of fraud, its symptoms and effective investigation techniques. Effective fraud prevention measures are discussed throughout the course. Emphasizes case studies and the application of principles to actual fraud cases.

**Prerequisites:** a C- or better in ACCT 451 or concurrent enrollment.

**ACCT 490. Selected Topics****1-3 Credits**

Current topics in accounting. Prerequisites vary according to the seminar offered. May be repeated for a maximum of 12 credits under different subtitles.

**ACCT 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ACCT 500. Concepts in Accounting****1 Credit**

Development, interpretation, and use of accounting information for financing, investing, operating, and managerial decision making.

**Prerequisite(s):** Admitted to MBA program.

**ACCT 503. Accounting for Managers****3 Credits**

Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to MAcc students.

**Prerequisite(s):** B or better in both ACCT 221 and ACCT 222.

**ACCT 510. Technical and Professional Communication for Accountants****3 Credits**

Effective writing strategies for professional communications. Students will learn to write with a professional style and proper English usage and to work with a variety of technical and lay audiences. Emphasis on initiation, planning, composition, and evaluation of business and accounting workplace scenarios to develop communication skills used in a business environment. Restricted to: Master of Accountancy majors.

**ACCT 525. Advanced Cost-Managerial Accounting****3 Credits**

Advanced cost-managerial concepts with a quantitative emphasis.

Integrates cost-managerial concepts, quantitative tools, organization theory, behavioral concepts and computer methodology. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 353.

**ACCT 530. Advanced Accounting****3 Credits**

This course is designed to provide in-depth study of current financial accounting concepts related to business combinations, financial statement consolidations, and foreign currency transactions and translations. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 302 with a grade of C or better.

**ACCT 544. Financial Statement Analysis and Valuation****3 Credits**

Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** Acct 302; Graduate students only.

**ACCT 550. Special Topics****3 Credits**

Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting. Prerequisites vary according to topic being offered.

**ACCT 551. Advanced Auditing Theory and Practice****3 Credits**

Understanding and evaluating internal control in an EDP environment. Statistical sampling applications and current issues in auditing. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 451.

**ACCT 554. Accounting Theory****3 Credits**

Contemporary theoretical basis of accounting. An in-depth study of generally accepted accounting principles and current issues in accounting. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 302.

**ACCT 555. Federal Tax Research****3 Credits**

Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 403.

**ACCT 559. Ethics and Professionalism in Accounting****3 Credits**

Introduction to ethical reasoning, integrity, objectivity, independence, and professional accounting issues. Students will apply the concepts and theories to accounting-specific cases. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** C or better in ACCT 451.

**ACCT 560. Taxation of Corporations and Shareholders Advanced****3 Credits**

Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 403.

**ACCT 564. Financial Accounting Research****3 Credits**

Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of Instructor required. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 302.

**ACCT 570. Taxation of Partnerships****3 Credits**

Taxation of partnership contributions and distributions, transfer of partnership interests, and allocations of partnership income. Also includes taxation of S corporations. Restricted to: Master of Accountancy majors.

**Prerequisite(s):** ACCT 403.

**ACCT 580. Professional Accountancy****3 Credits**

Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Restricted to: Master of Accountancy majors.

**ACCT 598. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisite:** consent of instructor.

**ACCT 599. Master's Thesis****15 Credits**

Thesis.

## ACES-AGRI, CONSUMER & ENV SCIE (ACES)

**ACES 101. Agricultural Leadership Development****1-3 Credits (1-3)**

This course will introduce the student to skill sets necessary to engage in the process of leadership through an applied project. A broad spectrum of principles and applications associated with the College of Agricultural, Consumer and Environmental Sciences will be employed. The development of a specific project through a collaborative process will be required. Students will be engaged in hands-on, real-time experiences applicable to agriculture. Course may be repeated once. Student must have a 3.5 GPA and above. Consent of Instructor required.

**ACES 111. Freshman Orientation****1 Credit**

Orientation to University life, including the understanding and utilization of resources that promote University success. Designed to promote success in achieving a career objective and perseverance for degree completion. Promotes a recognition of changes required in moving from high school to the University. Eight weeks in length, required for all freshmen in the College of Agricultural, Consumer and Environmental Science.

**ACES 121. Financial Fitness for College Students****1 Credit**

An introduction to personal financial practices in post high school and/or college lives. Emphasis is placed on budgeting, savings, investment, college debt, student loans, credit cards, scams and consumer protection.

**ACES 199. Academic Excellence****1-3 Credits (1-3)**

Academic curriculum of excellence that includes the development of collaborative learning and student success environment, learning diverse learning styles and multiple intelligences, and developing multi-contextual academic communication styles. Restricted to: Open to all ACES majors. Restricted to Las Cruces campus only.

**ACES 201. Agricultural Leadership Development****1-3 Credits (1-3)**

This course will introduce the student to skill sets necessary to engage in the process of leadership through an applied project. A broad spectrum of principles and applications associated with the College of Agricultural, Consumer and Environmental Sciences will be employed. The development of a specific project through a collaborative process will be required. Students will be engaged in hands-on, real-time experiences applicable to agriculture. Course may be repeated once. Student must have a 3.5 GPA and above. Consent of Instructor required.

**ACES 301. Agricultural Leadership Development****1-3 Credits (1-3)**

This course will introduce the student to skill sets necessary to engage in the process of leadership through an applied project. A broad spectrum of principles and applications associated with the College of Agricultural, Consumer and Environmental Sciences will be employed. The development of a specific project through a collaborative process will be required. Students will be engaged in hands-on, real-time experiences applicable to agriculture. Course may be repeated once. Student must have a 3.5 GPA and above. Consent of Instructor required.

**ACES 305. Advanced Leadership and Communication in Agricultural Sciences****1-3 Credits (1-3)**

Theory and application of advanced communication techniques, focusing on public speaking and public relations, are emphasized in this course for current and potential college ambassadors. May be repeated to a maximum of 8 credits. Consent of instructor required.

**ACES 401. Agricultural Leadership Development****1-3 Credits (1-3)**

This course will introduce the student to skill sets necessary to engage in the process of leadership through an applied project. A broad spectrum of principles and applications associated with the College of Agricultural, Consumer and Environmental Sciences will be employed. The development of a specific project through a collaborative process will be required. Students will be engaged in hands-on, real-time experiences applicable to agriculture. Course may be repeated once. Student must have a 3.5 GPA and above. Consent of Instructor required.

## **AEEC-AGRICULTURAL ECON/ECON (AEEC)**

**AEEC 501. Microeconomic Theory****3 Credits**

A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability.  
**Prerequisite(s):** ECON 371 and ECON 457, or consent of instructor.

**AEEC 502. Macroeconomic Theory****3 Credits**

Contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy.

**AEEC 511. Advanced Futures and Options Markets****3 Credits**

Advanced hedging and speculating strategies using futures and options contracts. Coverage includes interest rates, stock indexes, metals, currencies, livestock, and grains. Concepts of price analysis (technical and fundamental) and basis analysis; technical paper is required. Same as AG E/FIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AG E/FIN 311 and AEEC/FIN 311. Crosslisted with: FIN 511.

**AEEC 520. International Agricultural Trade Theory and Policy****3 Credits**

Review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives.

**Prerequisite:** ECON 371.

**AEEC 522. Public Sector Economics I****3 Credits**

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as GOVT 522.

**AEEC 523. Public Sector Economics II****3 Credits**

A continuation of AEEC 522. Concentrates on the economic effects of taxation. Same as GOVT 523.

**AEEC 526. Global Food Supply Chain Management****3 Credits**

This course aims to provide students a basic understanding of supply chain management issues, and encourages them to analyze problems from a systems perspective, and introduce them to a number of decision tools that are currently being used by the industry such as process analysis, product design, waiting line management, quality control, just-in-time, and inventory management.

**AEEC 528. Economic Development****3 Credits**

A graduate-level exposition of microeconomic and macroeconomic theory of why and how nations allocate resources to grow and develop. Strong emphasis is given to understanding the economic problems facing developing nations.

**AEEC 540. Econometrics I****3 Credits**

An integration of quantitative and statistical techniques for research and management in economics and business.

**Prerequisite(s):** ECON 457 and ECON 405 or A ST 505.

**AEEC 545. Advanced Agricultural Policy****3 Credits**

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AG E 445V with additional work required at the graduate level. Cannot receive credit for both AG E 445V and AEEC 545.

**Prerequisite:** consent of instructor.

**AEEC 550. Advanced Microcomputer Applications in Agriculture**  
**3 Credits (2+2P)**

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Taught with AG E 450 with additional coursework required at the graduate level. Cannot receive credit for both AG E 450 and AEEC 550.

**Prerequisite(s):** AG E 250G or consent of instructor.

**AEEC 551. Advanced Agribusiness Marketing**  
**3 Credits**

Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with emphasis on strategic marketing issues changing trade policies, and global competitiveness.

**Prerequisite:** consent of instructor.

**AEEC 556. Advanced Agribusiness Management**  
**3 Credits**

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach.

**AEEC 575. Economics of Water Resource Management and Policy**  
**3 Credits**

Focuses on issues, approaches and methods used in the assessment of water resource management and policy problems. Extends and further develops student understanding and comprehension of specific economic concepts and methods that are useful in the assessment and management of water resources, including cost-benefit analysis, welfare economics, non-market valuation, watershed management, and consideration of equity and ethical concerns. Students will develop critical reasoning, communication and analytic skills through active class discussions and assignments that emphasize both quantitative and written products.

**AEEC 585. Production Economics**  
**3 Credits**

Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 142G, ECON 312, and ECON 457.

**AEEC 590. Special Topics**  
**3 Credits**

Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.

**Prerequisite:** consent of instructor.

**AEEC 593. Internship**  
**1-6 Credits**

Supervised professional on-the-job training experience in policy analysis.

**AEEC 594. Internship**  
**1-6 Credits**

One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.

**AEEC 595. Internship**  
**3 Credits**

Supervised professional on-the-job learning experience.

**Prerequisite(s):** Consent of instructor.

**AEEC 596. Individual Study**  
**1-3 Credits**

Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.

**Prerequisite:** consent of instructor.

**AEEC 597. Non-Thesis Research Project**  
**1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree.

**AEEC 598. Creative Component Project**  
**3-6 Credits (3-6)**

Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree. Consent of instructor required. Restricted to AEEC majors.

**Prerequisite(s):** Consent of Instructor.

**AEEC 599. Master's Thesis**  
**15 Credits**

Thesis.

## AERO-AEROSPACE STUDIES (AERO)

**AERO 121. The Air Force Today I**  
**2 Credits (1.25+2P)**

Survey course on the USAF and AFROTC. Includes mission and organization of the Air Force, officer ship and professionalism, military customs and courtesies, as well as basic communication skills. Leadership Lab practicum, AERO 000 is included.

**AERO 122. The Air Force Today II**  
**2 Credits (1.25+2P)**

Continuation of AERO 121, with emphasis on Air Force officer opportunities, group leadership problems, and further development of communication skills (oral and written). Includes Leadership Lab practicum, AERO 000.

**AERO 221. The Air Force Way I**  
**2 Credits (1.25+2P)**

Topics include: Air Force heritage, Air Force leaders, an introduction to ethics and values, and an application of communication skills. Facilitates the transition from Air Force ROTC cadet to Air Force ROTC candidate. Includes Leadership Lab practicum, AERO CIOD.

**AERO 222. The Air Force Way II**  
**2 Credits (1.25+2P)**

Continuation of AERO 221, including an introduction to leadership, quality Air Force, and continued application of communication skills. Includes Leadership Lab practicum, AERO 000.

**AERO 223. Air Force Leadership Development**  
**1 Credit**

This course prepares cadets to excel in field training. Cadets are prepared in all facets of field training, including: leadership competency evaluations, the Cadet's Guide to Field Training, individual drill evaluations, attention to detail, dining hall procedures, maintenance of living areas, and the group problem solving process. Restricted to: Main campus only.

**AERO 301. Air Force Leadership and Management I****4 Credits (3+2P)**

Study of the leadership and quality management fundamentals, professional knowledge, Air Force doctrine, leadership ethics, and communication skills required of an Air Force junior officer. Includes Leadership Lab practicum, AERO 000.

**Prerequisites:** Completion of AERO 121/122 and 221/222, or permission of instructor.

**AERO 302. Air Force Leadership and Management II****4 Credits (3+2P)**

Continuation of AERO 301, with case studies used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts studied. Continued emphasis on developing communication skills. Includes Leadership Lab practicum, AERO 000. May be repeated up to 4 credits.

**Prerequisite(s):** Completion of AERO 121/122 and 221/222, or permission of instructor.

**AERO 401. Preparation for Active Duty I****4 Credits (3+2P)**

Examines the national security process, regional studies, and Air Force doctrine. Special topics focus on the military as a profession, officership, and civilian control of the military. Communication skills (oral and written) are refined. Includes Leadership Lab practicum, AERO 000.

**Prerequisites:** Completion of AERO 121/122, and AERO 221/222 or permission of instructor.

**AERO 402. Preparation for Active Duty II****4 Credits (3+2P)**

Continuation of AERO 401, concentrating on advanced leadership ethics, military justice, preparation for active duty, and current issues affecting military professionalism. Continued emphasis on communication skills necessary to succeed as a junior Air Force officer. Includes Leadership Lab practicum, AERO 000. May be repeated up to 4 credits.

**Prerequisite(s):** Completion of AERO 121/122, 221/222, 301/302, and 401 or permission of instructor.

**AERO 411. Aerospace Studies Independent Study****1 Credit**

This course provides in-depth research on specified topics of the United States Air Force and NMSU's Detachment 505 history. Consent of instructor required.

**Prerequisite(s):** AERO 301, AERO 302, AERO 401, AERO 402.

## AERT-AEROSPACE TECHNOLOGY (AERT)

**AERT 105. Aerospace Engineering PLTW****4 Credits (2+4P)**

Introduce the student to Aerospace Engineering (AE) concepts and history. Studied topics include History of Flight, Aerodynamics, Rocket Science, Orbital Physics, Systems Engineering and Life Support/ Environmental Systems. Restricted to: Community Colleges only.

**AERT 111. Basic Electricity and Electronics****3 Credits (2+2P)**

Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated fiber optics, and industrial application topics.

Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: ELT 105

**AERT 121. Introduction to the Aerospace Workplace****4 Credits (2+4P)**

The course covers space history, regulations, controls, aerospace industry terminology and acronyms as well as hands-on activities related to tools, procedures, and standard practices. Restricted to: Community Colleges only.

**AERT 122. Aerospace Safety and Quality****3 Credits (2+2P)**

Covers identification of hazards, personal protective equipment, safe practices, and protection of personnel, property, and equipment in the aerospace environment. Basic principles of quality assurance engineering and quality control relating to work processes will be discussed.

Restricted to: Community Colleges only.

**AERT 211. Electromechanical Devices****4 Credits (2+4P)**

Theory and application of electromechanical devices and digital control circuits. Includes AD and DA converters, pneumatics, hydraulics, programmable logic controllers, DC, AC and stepper motors, and servomechanisms. Crosslisted with: MAT 240.

**Prerequisite(s):** ELT 160.

**AERT 212. Materials and Processes (Basic Metallurgy)****3 Credits (2+2P)**

Basic Metallurgy: Aluminum and its alloys (Alclad), hardening, tempering, annealing, anodizing, magnetism, titanium, copper, stainless steel, surgical steel, safety wire, iron rust. Metallurgical Processes: Welding and soldering. Inspection Fundamentals: Eddy currents, magnetic particles (ferrous and non-ferrous metals), ultrasonic, x-ray, visual, corrosion and corrosion control, and vacuum bagging. Restricted to: Community Colleges only.

**AERT 213. Aerospace Fluid Systems****3 Credits (2+2P)**

This course includes a familiarization of fluid system components, characteristics, and applications. Cryogenic and hypergolic materials and high pressure systems are also covered. Restricted to: Community Colleges only.

**AERT 214. Aerospace Systems****3 Credits (2+2P)**

This course provides an introduction to expendable and reusable spacecraft systems including hydraulic, pneumatic, electrical, propulsion, mechanical, HVAC, and ECLSS (Environmental Control and Life Support System). How systems interact with computer and data acquisition systems is also covered. Restricted to: Community Colleges only.

**AERT 221. Inspection Requirements and Planning Metrology****3 Credits (2+2P)**

Course teaches the benefits of inspection, quality control, material conditions. Also covers measurements, including temperature, ultrasonic, vibration and more. Restricted to: Community Colleges only.

**AERT 222. Electromechanical Systems****3 Credits (2+2P)**

Principles and applications of preventive and corrective maintenance procedures on industrial production machines using systems technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams. Pre/ Crosslisted with: MAT 245.

**Prerequisite(s)/Corequisite(s):** AERT 221 or MAT 240. Prerequisite(s): ELT 160.

**AERT 224. Aerospace Tests and Measurements****3 Credits (2+2P)**

This course covers electrical and mechanical testing procedures (primarily non-destructive testing), equipment, measurements, and instrumentation involved in aerospace systems. Verification of tool and equipment calibration is also covered. Pre/ Restricted to: Community Colleges only.

**Corequisite(s):** AERT 221.

**AERT 225. Cooperative Experience****1-3 Credits (1-3)**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.

**AERT 255. Special Topics****1-4 Credits (1-4)**

Specific topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

**AERT 290. Independent Study****1-3 Credits (1-3)**

Individual studies in areas directly related to aerospace. Consent of instructor required. Restricted to: Community Colleges only.

## AG E-AGRICULTURAL ECONOMICS (AG E)

**AG E 100. Introductory to Food and Agribusiness Management****3 Credits**

Orientation to agricultural supply businesses, farm and ranch production, food markets, food processing and distribution, and food consumption. Microeconomic principles for managers. May be repeated up to 3 credits.

**AG E 101. Careers in Food and Agribusiness****1 Credit**

Orientation to agribusiness management. Students will learn about agricultural production and marketing in New Mexico, the United States, and the world. Students will be introduced to faculty and staff within the department, learn about career opportunities available to AEAB graduates, and develop a greater appreciation of agricultural management issues. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** Freshman status only or obtain consent of instructor.

**AG E 200. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. Consent of instructor required.

**AG E 210G. Survey of Food and Agricultural Issues****3 Credits**

Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with: FSTE 210G.

**AG E 236. Principles of Food and Agribusiness Management****3 Credits**

Description and application of management and financial principles, market planning, and organization theory in small business situations. May be repeated up to 3 credits.

**AG E 250. Technology and Communication for Business Management****3 Credits (2+2P)**

Understanding and improving skills for data analysis, information management and communication is the focus of this course. Drawing examples from a variety of management, business, technological and research situations, students discover the versatility and variety of uses of computer applications such as spreadsheet, database, presentation and document software. Emphasizing a 'hands-on' approach students learn the foundations of these tools and their use.

**AG E 260. Introduction to Food and Agribusiness Accounting****3 Credits**

Purpose and methods of keeping and analyzing farm and ranch records. Net worth and income statements, efficiency measures, analysis of the business, and tax computations. May be repeated up to 3 credits.

**AG E 300. Internship****1-4 Credits (1-4)**

Professional work experience under the supervision of a faculty member. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of instructor.

**AG E 305. Marketing and Food Agricultural Products****3 Credits**

Description of agricultural processes and functions; food production and consumption patterns; agricultural product prices; nature of competition in agricultural product markets; commodity markets. May be repeated up to 3 credits. Crosslisted with: MKTG 305.

**Prerequisite(s):** ECON 201G or ECON 252G.

**AG E 311. Financial Futures Markets****3 Credits**

Emphasis on financial instruments, currencies, and stock index futures. Principles of hedging, arbitrage, speculation, technical and fundamental price analysis, and trading strategies. Simulated computer trading game. Same as AECC/FIN 511 with additional coursework required at the graduate level. Cannot receive credit for both AG E/FIN 311 and AECC/FIN 511. Same as FIN 311.

**AG E 313. Food and Agricultural Sales****3 Credits**

Techniques of salesmanship including application of sales techniques. Identification and classification of buyer type and different approaches to sales based on client base. Improving oral communication skills through individual and/or group sales presentations. May be repeated up to 3 credits.

**Prerequisite(s):** Junior or above standing.

**AG E 314. Agricultural and Natural Resource Law****3 Credits**

Relationship of common-law principles, statutory law and regulatory law to problems involving agriculture with an emphasis on New Mexico issues. Legal problems relevant to agribusiness, torts, fencing laws, liability for agricultural pollution, irrigation water rights, corporations and partnerships, land tenure, farm and ranch tenancy, agricultural labor, farm and ranch management and taxation. May be repeated up to 3 credits.

**AG E 315V. World Agriculture and Food Problems****3 Credits**

Survey of food and agricultural issues in the U.S. and other countries. Covers: role of agriculture in economic development; trade in food and agricultural products; global food production, consumption, and marketing patterns; economics of technical change and food assistance; agriculture and the environment. Same as GEOG 315V.

**AG E 325. Food and Agribusiness Finance and Planning****3 Credits**

Understanding, using, and constructing financial statements for agribusiness analysis. Learn how to produce integrated pro forma financial statements first on paper and then on a spreadsheet. Prepare and link revenue, cost, and financing input assumptions formulas to the financial outcomes on the spreadsheet. May be repeated up to 3 credits. Crosslisted with: ANSC 325.

**Prerequisite(s):** AG E 250 or equivalent experience using spreadsheets.

**AG E 337V. Natural Resource Economics****3 Credits**

Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as ECON 337V.

**Prerequisite:** ECON 201G or ECON 252G.

**AG E 340. Economics of Food and Agricultural Markets****3 Credits**

Focuses on the analysis of supply and demand characteristics of commodities with particular attention to agricultural products. Pays special attention to empirical analysis. Includes institutional aspects of pricing, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 252G, MATH 142G, and A ST 311 or A ST/STAT 251G.

**AG E 342. Economic Analysis of Food and Agribusiness****3 Credits**

A discussion and application of economic, managerial, and financial considerations in agricultural business. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 251G, ECON 252G.

**AG E 384V. Water Resource Economics****3 Credits**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as ECON 384V.

**Prerequisite:** AG E 100 or ECON 252G.

**AG E 385. Applied Production Economics****3 Credits**

Analysis of economic principles of agricultural production and planning, emphasizing marginal principles. Practical application in budgeting and analyzing profit maximizing agricultural-production strategies. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 252G, MATH 142G, and A ST 311 or A ST/STAT 251G.

**AG E 400. Seminar****1 Credit**

Current topics and cases in the agribusiness literature stressing rigorous qualitative analysis of current problems and policy issues. Consent of Instructor required. Restricted to: AEAB; NREP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Senior standing.

**AG E 406. The Economics of Sports****3 Credits**

Applying the tools of economic analysis to a particular industry and gaining an in-depth knowledge of the interaction of professional sports teams and leagues with the economy and society. Same as ECON 406.

**AG E 420. Special Problems****1-3 Credits**

Special problems in agricultural economics or agricultural business of particular interest to the individual student. Maximum of 3 credits per semester. No more than 6 credits toward degree. Consent of instructor required.

**AG E 425. Food and Agribusiness Financial Management****3 Credits**

Description and application of techniques and principles of financial management to problem situations faced by agricultural businesses, including financial statement development and analysis, capital budgeting, sources and costs of capital. May be repeated up to 3 credits.

**Prerequisite(s):** ECON 252G and ACCT 221.

**AG E 445V. Agricultural Policy****3 Credits**

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts.

**Prerequisites:** ECON 251G and ECON 252G.

**AG E 450. Spreadsheet Applications in Food and Agriculture****3 Credits (2+2P)**

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural application. Same as AEBC 550 with additional work for graduate credit. Cannot receive credit for both AG E 450 and AEBC 550. May be repeated up to 3 credits.

**Prerequisite(s):** AG E 250 or consent of instructor.

**AG E 451. Food and Agribusiness Market Assessment and Research****3 Credits**

Applications course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: MKTG 451.

**Prerequisite(s):** AG E 305 or MKTG 305 or consent of instructor.

**AG E 452. Food and Agribusiness Marketing Plan Development****3 Credits**

This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions. May be repeated up to 3 credits.

**AG E 456. Case Studies in Food and Agribusiness Management****3 Credits**

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach. May be repeated up to 3 credits.

**Prerequisite(s):** Senior standing.

**AG E 458. Economics of Making and Marketing Wine****3 Credits**

Economics of making and marketing wine for small commercial wineries and amateurs. The class starts with selecting, crushing, and fermenting grapes and all the steps required through bottling the wine. Students must be 21 to enroll in the class. Consent of instructor required.

**AG E 470. Real Estate Appraisal****3 Credits (2+2P)**

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with: FIN 470

**Prerequisite(s):** Junior or above standing.

**AG E 499. Senior Thesis****3 Credits**

Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. Restricted to AEAB majors.

**Prerequisites:** consent of department head and have senior standing.

## AGRO-AGRONOMY (AGRO)

**AGRO 100G. Introductory Plant Science****4 Credits (3+2P)**

Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as HORT 100G.

**AGRO 200. Special Topics****1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

**AGRO 250. Plant Propagation****3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Crosslisted with HORT 250.

**AGRO 300. Special Topics****1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**AGRO 303V. Genetics and Society****3 Credits**

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: GENE 303V.

**AGRO 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: ANSC 305, BIOL 305, HORT 305 and GENE 305.

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**AGRO 311. Introduction to Weed Science****4 Credits**

Principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Same EPWS 311.

**Prerequisite:** junior standing or consent of instructor and CHEM 111G and BIOL 211G.

**AGRO 315. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 315

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**AGRO 365. Principles of Crop Production****4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Crosslisted with: HORT 365

**Prerequisite(s):** AGRO/HORT 100, CHEM 111G or equivalent and MATH 120 or equivalent.

**AGRO 377. Introduction to Turfgrass Management****4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: HORT 377

**AGRO 391. Internship****1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**Prerequisite(s):** Consent of instructor.

**AGRO 447. Seminar****1 Credit**

Organization, preparation, and presentation of current topics in agronomy, horticulture, and soil science. Same as HORT 447 and SOIL 447.

**AGRO 449. Special Problems****1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**AGRO 450. Special Topics****1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

**AGRO 462. Plant Breeding****3 Credits**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

**AGRO 471. Plant Mineral Nutrition****3 Credits**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as HORT 471 and EPWS 471.

**Prerequisite:** EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

**AGRO 483. Sustainable Production of Agronomic Crops****4 Credits (3+2P)**

Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of cereal grain, fiber, forage and oilseed crops.

**Corequisite(s):** AGRO 365 or HORT 365.

**AGRO 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: HORT 486, E S 485, SOIL 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**AGRO 492. Diagnosing Plant Disorders****3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and HORT 492.

**Prerequisites:** EPWS 303 and EPWS 310.

**AGRO 500. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**AGRO 505. Research Orientation****4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505 and SOIL 505

**AGRO 506. Plant Genetics****3 Credits**

Advanced treatment of the principles of classical genetics and heredity with emphasis on the nature and action of the gene including molecular analysis. May be repeated up to 3 credits. Crosslisted with: HORT 506. CHEM 345 recommended.

**Prerequisite(s):** AGRO/GENE/HORT/BIOL/ANSC 305 or consent of instructor.

**AGRO 511. Introduction to Weed Science (f)****4 Credits**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Same as EPWS 511.

**Prerequisites:** CHEM 111G or BIOL 211G, or consent of instructor.

**AGRO 514. Soil-Plant Relationships****3 Credits**

Physical, chemical, and biological soil environment as it affects plant and crop growth. Same as HORT 514 and SOIL 514.

**Prerequisites:** BIOL 314, SOIL 252.

**AGRO 515. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 515

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**AGRO 516. Molecular Analysis of Complex Traits****3 Credits**

Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Same as HORT 516.

**Prerequisite:** AGRO 305 or consent of instructor.

**AGRO 525. Scientific Writing- How to be a Productive and Effective Writer 1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: HORT 525, EPWS 525, SOIL 525, AGRO 625, HORT 625 and SOIL 625.

**AGRO 533. Environmental Physiology of Plants****3 Credits**

Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Same as BIOL/HORT 533.

**Prerequisite:** BIOL 314 or consent of instructor.

**AGRO 590. Graduate Seminar****1 Credit**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as HORT/SOIL 590. Crosslisted with: HORT 590 and SOIL 590.

**AGRO 595. Internship****1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

**AGRO 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: E S 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

**Prerequisite(s):** Master level graduate students.

**AGRO 597. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Restricted to: Main campus only. Restricted to Agronomy and Horticulture Graduate Students. Crosslisted with: HORT 597 and SOIL 597

**AGRO 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.

**AGRO 599. Master's Thesis****15 Credits**

Thesis.

**AGRO 600. Doctoral Research****1-15 Credits**

Research.

**AGRO 609. Breeding for Plant Disease Resistance****3 Credits**

A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. Same as HORT 609.

**AGRO 610. Advanced Crop Breeding****4 Credits (3+3P)**

Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. Same as HORT 610.

**Prerequisite:** AGRO 462 or consent of instructor.

**AGRO 620. Instrumentation in Agronomy****3 Credits**

Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as HORT/SOIL 620.

**AGRO 625. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students in the 600-level course will be required to perform additional research than those students in the 500-level cross-listing Crosslisted with: AGRO 525, HORT 525, EPWS 525 and SOIL 525.

**AGRO 670. Biometrical Genetics and Plant Breeding****3 Credits**

A statistical approach to gene action and population parameters as applied to plant improvement. Same as HORT 670.

**Prerequisite:** AGRO 462 or consent of instructor.

**AGRO 694. Doctoral Seminar****1 Credit**

Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. Same as SOIL 694.

**Prerequisite:** doctoral level graduate students.

**AGRO 696. Doctoral Proposal****1 Credit**

Current research proposal written by doctoral level graduate students. Not more than 1 credits toward the degree. May be repeated up to 1 credits. Crosslisted with: E S 696, AGRO 696, HORT 696 and SOIL 696.

**Prerequisite(s):** Doctoral level graduate students.

**AGRO 697. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: HORT 697 and SOIL 697

**AGRO 698. Topics in Agronomy****1-6 Credits**

Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**AGRO 700. Doctoral Dissertation****15 Credits**

Dissertation.

## AHS-ALLIED HEALTH SCIENCE (AHS)

**AHS 102. Careers in the Health Fields****1-3 Credits (1-3)**

This course will provide students with a broad understanding of health careers as well as emerging issues in health. This will also include the study of the functional roles of practice, education, administration, and research in health fields. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**AHS 115. Dietary Guidelines & Meal Planning****4 Credits**

A combination of the science of nutrition and the current Dietary Guidelines for Americans with practical application to meal planning and preparation. Strategies and techniques used to plan and prepare healthful and appetizing meals are explored. Evidenced-based dietary guidelines are provided to meet the needs of individuals and groups with chronic diseases. Menu development, modification and analysis are reviewed. Restricted to Community Colleges campuses only.

**AHS 116. Math for Health Occupations****3 Credits**

Principles of math and pharmacology necessary for administration of medications. Restricted to: Community Colleges only.

**Prerequisite(s):** CCDM 114N or equivalent.

**AHS 120. Medical Terminology****3 Credits**

The study and understanding of medical terminology as it relates to diseases, their causes and effects, and the terminology used in various medical specialties. Emphasis will be placed on learning the basic construction of medical words, appropriate spelling, use of medical terms, and use of medical abbreviations. Same as HIT 150. May be repeated up to 3 credits. Crosslisted with: NURS 150 and BOT 150. Restricted to Community Colleges campuses only.

**AHS 140. Essentials of Anatomy and Physiology****4 Credits (3+3P)**

Essentials of anatomy and physiology for those considering a career in health as well as those interested in understanding their own body and the basics of health.

**AHS 153. Introduction to Anatomy and Physiology I****4 Credits (3+3P)**

Survey of human anatomy and physiology.

**Prerequisite:** high school biology or high school chemistry, or CHEM 110G, or consent of instructor.

**AHS 155. Special Topics****1-6 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**AHS 165. Foundations to Allied Health Science****3 Credits (1+4P)**

A foundational course which will cover a multidisciplinary focus on success in the Allied Health care environment. Topics included, but not limited to: the health care system, personal and professional qualities of a health care worker, legal and ethical responsibilities, cultural diversity, nutrition and diets, medical math, infection control, preparing for the world of work, core measures and quality assurance, the prospective payment system, customer service, current trends in health care and communication, and promotion of safety. Laboratory time will cover library and library resource use, promotion of safety, vital sign, CPR & AED use, job interviewing practice, and 16 hours of job shadowing participation located in a healthcare facility. Open to all students seeking to pursue an Allied Health or Healthcare career pathway. Restricted to Community Colleges campuses only.

**AHS 190. Clinical Skills & Concepts for Medical Assisting I****6 Credits (3+6P)**

A core course designed to provide an introduction to the theory, concepts, and skills needed for entry-level medical assisting positions. Content includes basic theory and concepts designed to support safe and effective practice as a medical assistant in ambulatory care settings. Includes a skills laboratory for hands-on practice and 96 hours of supervised clinical in the work environment. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (BIOL 225 and 226) or (AHS 153 and 154).

**AHS 202. Legal and Ethical Issues in Health Care****3 Credits**

Consideration of legal and ethical issues in modern health care delivery.

**AHS 250. SPANISH FOR HEALTH PROFESSIONALS****3 Credits**

Spanish for Health Professionals is a 3 credit course geared toward individuals working or majoring in health related areas. The course focus is on conversation and vocabulary needed for the workplace and task based practical skills. Restricted to: Community Colleges only.

**AHS 280. Medical Office Administration & Management****4 Credits (2+4P)**

A core course designed to provide the theory, concepts, and skills needed in preparation for entry-level medical assisting positions. Content includes theory and concepts related to medical office administration. The course includes skills, hands-on practice, and 40 hours of supervised clinical in the work environment in ambulatory care settings.

**Prerequisite(s)/Corequisite(s):** AHS 190. Restricted to Community Colleges campuses only.

**AHS 290. Clinical Skills & Concepts for Medical Assisting II****6 Credits (3+6P)**

A core course designed to provide the theory, concepts, and skills needed in preparation for entry-level medical assisting positions. Content includes theory and concepts related to specialty areas of healthcare practice, as well as consideration for conditions affecting persons throughout the life span. The course includes a skills laboratory for hands-on practice and 96 hours of supervised clinical in the work environment with specialized populations and procedures in both ambulatory and acute care settings. Restricted to Community Colleges campuses only.

**Prerequisite(s):** AHS 190.

**AHS 295. Introduction to Allied Health****1 Credit**

An introductory course that covers a multidisciplinary focus needed for success in the allied health care environment. Topics include health care delivery systems and allied health careers, history of health care, law and ethics pertaining to health care, personal qualities of health care workers, confidentiality and reportable incidents. This course will also cover an orientation into safety and infection control, core measures and quality assurance, perspective payment system, customer service, current trends in health care and communication, skills to be a patient/client educator and a member of the Health Care team. Open to all students wanting to explore the allied health care industry. Restricted to Community Colleges campuses only.

## ANSC-ANIMAL SCIENCE (ANSC)

**ANSC 100. Introductory Animal Science****3 Credits**

Orientation and survey of livestock industry in the United States; introduction to feeding, breeding, and management practices for producing farm animals and select companion animals.

**ANSC 100 H. Introductory Animal Science****3 Credits**

Orientation and survey of livestock industry in the United States; introduction to feeding, breeding and management practices for producing farm animals and select companion animals. Additional course work will be required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Eligibility for membership in honors college.

**ANSC 100 L. Introductory Animal Science Laboratory****1 Credit**

Students will observe and participate in activities related to farm animal management and will include areas of livestock selection, nutrition, reproductive physiology, animal ID and animal health. This lab is required for animal science majors. Pre/

**Corequisite(s):** ANSC 100.

**ANSC 103. Introductory Horse Science****3 Credits (2+2P)**

The light horse industry; breeds; introduction to feeding, breeding, marketing and management; handling and selecting horses for breeding and performance.

**ANSC 112. Companion Animals in Society****3 Credits**

Examination of the historical, current, and potential future roles of companion animals in human society. Topics include animal domestication, breeds, exotic companion animals, the companion animal industry, and competitions and sports involving companion animals. Emphasis is on canine and feline species. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**ANSC 190. Western Equitation I****2 Credits**

Basic principles of Western riding, including care and management of the riding horse, equitation equipment, and development of riding skills.

**ANSC 200. Introduction to Meat Animal Production****3 Credits (2+2P)**

Production and utilization of beef cattle, sheep and swine; emphasis on feeding, breeding, management problems and marketing; selection of animals for breeding and market.

**ANSC 201. Introduction to Genetics for Animal Production****3 Credits**

Introduction to genetics and inheritance relative to livestock production. Introduction to procedures for collection and use of performance information in livestock improvement programs.

**Prerequisites:** BIOL 111G.

**ANSC 205. Introduction to Dairy Science****3 Credits**

Introduction to the basic aspects of dairy science and how to apply key concepts to the practical feeding and management of dairy cattle and production of dairy products. Students should also obtain an appreciation for the size and diversity of the dairy industry.

**Prerequisite(s)/Corequisite(s):** ANSC 100. Restricted to Las Cruces campus only.

**ANSC 220. Animal Science Career Development****1 Credit**

Introduction to scientific disciplines and career options in animal-agriculture career-skill development, including resume preparation, networking, importance of internships, and leadership experiences in animal agriculture.

**ANSC 250. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**ANSC 261. Introduction to Animal Metabolism****3 Credits**

Principles underlying the mechanisms of animal metabolism as they relate to production, maintenance, and health of animals.

**Prerequisite:** CHEM 111G.

**ANSC 262. Introduction to Meat Science****3 Credits (2+3P)**

Fundamental aspects of the red meat industry. Lecture topics and laboratory exercises include the nutrient value of meat, meat preservation, meat safety, muscle structure and contraction, slaughter and processing of beef, lamb, and pork, sausage manufacture, meat curing, meat cookery, and muscle and bone anatomy.

**ANSC 285. Introduction to Companion Animal Science****3 Credits**

Introduction to the care of common companion animal species. Species specific housing and nutrition are covered in the context of maximizing animal health and well-being and reducing disease. May be repeated up to 3 credits.

**ANSC 288. Horse Fitting and Selling****3 Credits**

Preparation of horses for sale; planning and conduct of auction sale; application of marketing principles relating to selling horses.

**Prerequisite:** ANSC 103 or consent of instructor.

**ANSC 289. Management of Equine Operations****3 Credits**

Introduction and application of business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

**Prerequisite(s):** ANSC 103 or consent of instructor.

**ANSC 290. Western Equitation II****2 Credits**

Intermediate principles of Western riding, including reading horse behavior, limbering-up exercises, and developing riding skills. Introduction to rollbacks, turnarounds and stops.

**Prerequisite:** consent of instructor.

**ANSC 295. Team Competition in Animal Science****1-2 Credits**

Training in team competition in the animal sciences. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**ANSC 301. Animal and Carcass Evaluation****3 Credits (2+2P)**

Determination of the market value of meat animals by relating live animal and carcass traits. Topics include the identification of economically important traits, grading, growth and development, wholesale and retail pricing, and futures and options markets.

**ANSC 302. Therapeutic Horseback Riding I****3 Credits**

Basic principles and understanding of horsemanship and therapeutic riding, including equipment, safety, how to be an effective volunteer, side walker, and horse handler. Consent of instructor required.

**ANSC 303. Livestock, Meat and Wool Evaluation****4 Credits (3+2P)**

Selection, classification, grading, and judging of livestock, meat, and wool.

**ANSC 304. Feeds and Feeding****3 Credits (2+2P)**

Digestibility of feeds, their nutritive values, grades, and classes, principles of ration formulation and computer ration formulations, and practical feeding of farm animals.

**Prerequisite(s):** CHEM 111G, General Chemistry I.

**ANSC 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, BIOL 305, HORT 305 and GENE 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**ANSC 308. Horse Evaluation****4 Credits (2+4P)**

Students will acquire a working knowledge of selection and classification of horses, learn criteria for evaluation and selection of breeding and show animals, gain a broad understanding of judging conformation and performance in the horse, and learn effective oral and written communication skills through defense of class placings. This course is considered an introduction to the NMSU Horse Judging Team.

**ANSC 310. Exhibiting Livestock****3 Credits (1+4P)**

Fitting and showing beef cattle, dairy cattle, sheep and swine.

**ANSC 312V. Companion Animals and the Human- Animal Interaction**  
**3 Credits**

The science behind human-animal interactions (HAI). An examination of the interactions between humans and companion animals and the effects on human and animal health and wellness. Cultural differences in HAI will be explored. Topics will include Animal Assisted Activity (AAA), Animal Assisted Therapy (AAT), and service animals. Emerging and future uses of companion animals in HAI will be discussed.

**ANSC 320. Equine Behavior and Training**  
**3 Credits**

Basic principles, methods and philosophies of handling, breaking and training the two-year-old Western horse. May be repeated up to 6 credits.

**Prerequisite(s):** ANSC 290 or consent of instructor.

**ANSC 321. Advanced Equine Behavior and Training**  
**3 Credits**

Continuation of ANSC 320. Further development of skills required to advance the training of the two-year-old Western horse. Emphasis will be placed on lateral work, lead changes, turn-arounds, obstacles, and making the horse accustomed to ranch and trail riding situations.

**Prerequisite(s):** ANSC 320 or consent of instructor.

**ANSC 325. Food and Agribusiness Finance and Planning**  
**3 Credits**

Same as AG E 325. May be repeated up to 3 credits. Crosslisted with: AG E 325.

**ANSC 350. Special Topics**  
**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**ANSC 351V. Agricultural Animals of the World**  
**3 Credits**

Global study of the development and use of animals for production of food and nonfood products. Climatic, cultural, and economic influences on systems of livestock production and species and breeds of livestock utilized will be evaluated.

**ANSC 353. Advanced Livestock Evaluation**  
**2 Credits**

Advanced selection, classification and grading of livestock. May be repeated up to 2 credits. Consent of Instructor required.

**ANSC 363. Meat Technology**  
**3 Credits**

Structure function and composition of muscles; factors influencing conversion of muscle to meat; buying, palatability and nutritive value of meat and meat products.

**ANSC 370. Anatomy and Physiology of Farm Animals**  
**4 Credits (3+2P)**

Structure and function of the animal body. Includes studies of the horse, cow, sheep, pig, and comparisons with the human body.

**Prerequisite(s):** CHEM 111G and BIOL 111G or BIOL 211G.

**ANSC 383. Equine Reproductive Management**  
**3 Credits (1+4P)**

Anatomy, physiology, and endocrinology of reproduction of the mare and stallion; training in modern reproductive techniques employed in the horse industry.

**Prerequisites:** ANSC 103, ANSC 289, and ANSC 370.

**ANSC 390. Internship**  
**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

**Prerequisite:** consent of instructor.

**ANSC 391. Undergraduate Research Experience**  
**1-3 Credits (1-3)**

Formal laboratory, library, or field study of problems related to animal sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of three credits. Consent of Instructor required.

**Prerequisite(s):** Consent of Instructor.

**Corequisite(s):** NO.

**ANSC 392. Animal Sciences Teaching/Extension Experience**  
**1-3 Credits (1-3)**

: Formal teaching experience related to animal sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students may also be involved in development, implementation, or assessment of adult or youth educational programs related to animal sciences, supervised by a faculty member. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of three credits. Consent of Instructor required.

**ANSC 395. Team Competition II**  
**1-2 Credits**

Advanced training in team competition in the animal sciences. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**ANSC 402. Animal Science Seminar**  
**1 Credit**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

**ANSC 402 H. Animal Science Seminar**  
**1 Credit**

Taught with ANSC 402 with additional work.

**Prerequisite(s):** Meets Honors eligibility and/or Crimson Scholar status.

**ANSC 411. Canine and Feline Behavior and Training**  
**3 Credits**

The influence of domestication, breeds, genetics, and physiology on the behavior of canine and feline species. Training methods and modification of problem behaviors are examined. The impact of the pet parent on their animal's behavior is addressed. May be repeated up to 3 credits.

**Prerequisite(s):** Junior or Senior status or consent of the instructor.

**ANSC 412. Canine and Feline Health and Diseases**  
**3 Credits**

A review of common infectious and non-infectious diseases and the basics of the immune response. Pathophysiology and treatment of these diseases and the role the pet parent plays in pre-disposing their animals to disease. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC 285 or consent of instructor.

**ANSC 421. Physiology of Reproduction****4 Credits (3+2P)**

Fertility and the role of hormones, nutrition, selection, management and environment in the maintenance of high reproductive rate.

**Prerequisite(s):** ANSC 370.

**ANSC 422. Animal Nutrition****3 Credits**

Nutrient utilization and measurement and nutrient requirements for the various body functions.

**Prerequisite(s):** CHEM 211 or CHEM 313 or ANSC 261.

**ANSC 423. Animal Breeding****3 Credits (2+2P)**

Mating systems, and selection procedures; calculation of inbreeding coefficients, genetic relationships, and gene frequency.

**Prerequisite(s):** ANSC 201 or 305.

**ANSC 424. Swine Production****3 Credits (2+2P)**

Breeding, feeding, and care of swine.

**Prerequisite(s):** ANSC 304.

**ANSC 425. Horse Science and Management****3 Credits (2+2P)**

Senior level course requiring students to apply basic knowledge acquired in the previous courses to solve typical problems encountered in the horse industry. Specific topics include genetics and animal breeding, business and legal issues, reproduction, health, nutrition and exercise physiology.

**Prerequisite(s):** ANSC 304 and ANSC 370 or concurrent registration.

**ANSC 426. Beef Production: Cow-Calf Management****3 Credits (2+2P)**

Senior level course examining management practices for the cow-calf producers. Specifically focusing on nutrition, reproduction, genetics, marketing, and health. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC 304 and (ANSC 201 or ANSC 305) or concurrent registration.

**ANSC 427. Dairy Production****3 Credits (2+2P)**

Breeding, nutrition, physiology and management of dairy cattle.

**Prerequisite(s):** ANSC 304 and (ANSC 201 or ANSC 305) or concurrent registration.

**ANSC 428. Sheep and Wool Production****3 Credits (2+2P)**

Genetics, nutrition, physiology and management of sheep. Wool grading, shearing, and disease control.

**Prerequisite(s):** ANSC 304 and junior status.

**ANSC 429. Beef Production: Feedlot Management****3 Credits**

Senior level course in feedlot management of beef cattle. Topics of interest include cattle handling and processing, health and nutrition, intake management, and growth. Feed mill operation, marketing strategies, and regulatory concerns associated with finishing cattle production may also be discussed.

**Prerequisite(s):** ANSC 304 or Consent of Instructor.

**ANSC 448. Problems****1-4 Credits**

Individual investigation in a specific area of animal science. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**ANSC 458. Livestock Behavior, Welfare and Handling****3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: RGSC 458

**Prerequisite(s):** RGSC 294 or ANSC 100.

**ANSC 462. Parasitology****3 Credits**

Same as EPWS 462.

**ANSC 462 L. Parasitology Lab****1 Credit**

Classification, biological effects, and management of animal parasites of man, domestic animals, and wildlife. One-hour lab is optional. Same as EPWS 462.

**ANSC 468. Advanced Dairy Herd Management****3 Credits**

The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as topics vary. Consent of instructor required.

**Prerequisite(s):** ANSC 304.

**ANSC 480. Environmental Physiology of Domestic Animals****3 Credits**

Influence of environmental factors on physiological processes of domestic animals.

**Prerequisite:** ANSC 370.

**ANSC 484. Ruminant Nutrition****3 Credits**

Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds.

**Prerequisite:** ANSC 422.

**ANSC 488. Equine Nutrition and Exercise Physiology****3 Credits (2+2P)**

Students will gain an in-depth understanding of nutrition and exercise physiology in the horse. Students will investigate the response of major physiological systems to exercise, conditioning and training, gastrointestinal physiology, nutrition requirements and clinical nutrition of the horse.

**Prerequisite(s)/Corequisite(s):** Junior standing or consent of instructor.

**ANSC 501. Advanced Animal Nutrition (so)****3 Credits**

Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied.

Crosslisted with: HNDS 501

**Prerequisite(s):** CHEM 211 or consent of instructor.

**ANSC 504. Animal Physiology Techniques (se)****4 Credits**

Radioimmunoassay procedures. Methods and procedures for conducting reproductive physiology research in livestock. Includes animal preparation, sample collection, laboratory and cell culture procedures.

**Prerequisite:** consent of instructor.

**ANSC 507. Laboratory Techniques in Nutrition (f)****4 Credits (2+6P)**

Methodology and experimental procedures in measuring nutrient requirements and value of diets. Same as HNDS 507.

**Prerequisites:** ANSC 422 or consent of instructor.

**ANSC 509. Endocrinology of Domestic Animals (f)****3 Credits**

The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.

**ANSC 510. Range Nutrition Techniques (se)****3 Credits**

Animal and plant methods of determining quantity and quality of range forage. Same as RGSC 510.

**Prerequisite:** ANSC 484 or consent of instructor.

**ANSC 512. Research Methods in Animal Science (s)****4 Credits (3+2P)**

Procedures used in animal science research, including planning and conduct of investigations and interpretation of results. Same as HNDS 512.

**ANSC 515. Graduate Seminar****1 Credit**

Current topics. Same as HNDS 517.

**ANSC 520. Advanced Nutritional Management I: Feedlot (se)****3 Credits**

Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management.

**Prerequisite:** ANSC 484 or consent of instructor.

**ANSC 521. Advanced Nutritional Management II: Cow Calf/Stocker (so)****3 Credits**

Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management.

**Prerequisite:** ANSC 484 or consent of instructor.

**ANSC 522. Animal Nutrition (f)****3 Credits**

Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 and same as HNDS 522 with additional requirements for graduate students. Recommended for nonmajors. Crosslisted with: HNDS 522

**Prerequisite(s):** CHEM 211.

**ANSC 560. Rumen Microbiology (so)****3 Credits**

Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Same as FSTE 560.

**Prerequisites:** ANSC/HNDS 501.

**ANSC 580. Environmental Physiology of Domestic Animals****3 Credits**

Influence of environmental factors on physiological processes of domestic animals. Specific focus on fetal and developmental programming, heat and cold stress.

**ANSC 588. Equine Nutrition and Exercise Physiology****3 Credits**

Students will gain an in-depth understanding of nutrition and exercise, conditioning and training, gastrointestinal physiology, nutrition requirements and clinical nutrition of the horse.

**Prerequisite(s)/Corequisite(s):** ANSC 304 and ANSC 422.

**ANSC 598. Special Research Programs****1-4 Credits (1-4)**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**ANSC 599. Master's Thesis****15 Credits**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

**ANSC 600. Research****1-15 Credits**

This course is for Ph.D. students before they have completed qualifiers. Consent of Instructor required. Thesis/Dissertation Grading.

**Prerequisite(s):** ANSC 421 or consent of instructor.

**ANSC 602. Advanced Reproductive Physiology (fo)****3 Credits**

Mechanisms of reproductive function; research methodology.

**Prerequisite(s):** ANSC 421 or consent of instructor.

**ANSC 602 L. Molecular Techniques in Reproductive Physiology (fo)****2 Credits**

Molecular biology techniques used in the study of reproductive physiology in domestic animals. Extraction of RNA, DNA from endocrine tissues, northern analysis, culture of pituitary/ovarian tissue. Mechanisms of hormone action.

**Prerequisite:** consent of instructor.

**ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)****1 Credit**

Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis.

**Prerequisite:** ANSC 509.

**ANSC 605. Gonadal and Uterine Endocrinology (fe)****1 Credit**

Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts.

**Prerequisite:** ANSC 509.

**ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe)****1 Credit**

Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals.

**Prerequisite:** ANSC 509.

**ANSC 621. Metabolic Functions and Dysfunctions (fe)****3 Credits**

Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology. Same as HNDS 621.

**Prerequisites:** CHEM 345 and ANSC 501.

**ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo)****4 Credits**

Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants. Same as HNDS 625.

**Prerequisite:** ANSC/HNDS 501.

**ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)****4 Credits**

Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use. Same as HNDS 626.

**Prerequisite:** ANSC 501 or HNDS 501.

**ANSC 698. Special Research Programs****1-4 Credits**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**ANSC 700. Doctoral Dissertation****15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

## ANTH-ANTHROPOLOGY (ANTH)

**ANTH 115. Native Peoples of North America****3 Credits**

Provides an introduction to the geography, environment, prehistoric cultural origins, sociopolitical organization, language, economics, material culture and technology, religious beliefs and practices, and historic period culture change of Native peoples of North America.

**ANTH 116. Native Peoples of the American Southwest****3 Credits**

Introduction to the early history and culture of native people of the Southwest.

**ANTH 118. Introduction to Historic Preservation****3 Credits**

Introduction to historic preservation, its history, goals, methods, legal basis, and economic importance. Explores public role in decision-making. Community Colleges only.

**ANTH 120G. Human Ancestors****3 Credits**

Evolutionary history of the human species from its origin in the primate order, with primary emphasis on the evolution of humankind during the past three million years. Examination of the social lives of apes and consideration of similarities to and differences from them. Biological foundations of human behavior, emphasizing thought, movement, and interaction.

**ANTH 125G. Introduction to World Cultures****3 Credits**

Examine cross-cultural diversity and human universals through the lens of anthropological inquiry. Explore human thought and behavior in contemporary world cultures covering kinship, economic patterns, power structures, and religious practices and beliefs. The impact of cultural influence on everyday life is emphasized.

**ANTH 130G. Human's Place in Nature: Introduction to Biological Anthropology****3 Credits**

This course uses scientific methods and principles to examine human evolutionary history and family tree relationships, as well as the biological foundations of human behavior. Through lectures, readings and laboratory assignments students are introduced to the history and development of modern evolutionary biology, molecular and population genetics, the primate and human fossil record and modern human biological diversity. By examining the social lives of apes and other primates, primitive and unique aspects of human behavior are identified and the lives of fossil ancestors are reconstructed.

**Corequisite(s):** ANTH 130GL.

**ANTH 130GL. Human's Place in Nature Laboratory****1 Credit**

This one credit laboratory course uses scientific methods and principles to examine evidence for human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity.

**ANTH 201G. Introduction to Anthropology****3 Credits**

Exploration of human origins and the development of cultural diversity. Topics include biological and cultural evolution, the structure and functions of social institutions, belief systems, language and culture, human-environmental relationships, methods of prehistoric and contemporary cultural analysis, and theories of culture.

**ANTH 202G. World Archaeology****3 Credits**

This course is an exploration of human evolution and cultural development throughout the world. Students will be introduced to basic anthropological methods and theories and will learn how anthropological research has contributed to our understanding of major themes in human prehistory, including human evolution, the origins of culture, migration and colonization, animal and plant domestication, and the rise and fall of civilizations.

**ANTH 203G. Introduction to Language and Cultural Anthropology****3 Credits**

Provides an introduction to the methods, theories, and results of two subfields of anthropology: linguistics and cultural anthropology. Linguistics is the study of human language. Cultural anthropology is the study of the organizing principles of human beliefs and practices.

**ANTH 297. Elementary Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**ANTH 301. Cultural Anthropology****3 Credits**

Human concepts of culture and life processes.

**ANTH 305V. Contemporary Native Americans****3 Credits**

Introduction to contemporary native peoples and cultures of North America. Emphasis on sociocultural and socioeconomic history, sociocultural change and persistence, present day reservation life, and current social and economic goals.

**ANTH 306V. Peoples of Latin America****3 Credits**

Introduction to cultural patterns and diversity of Latin America with emphasis on indigenous groups, peasants, plantation workers, and urban residents throughout South America, the Caribbean, Mexico, and Central America.

**ANTH 307. Anthropology of Mexico and Guatemala****3 Credits**

This course focuses on ethnographic study of people in Mexico and Guatemala. Through reading and discussing a variety of ethnographic works, the course will examine some historical and contemporary issues facing different groups of people in this region and will include topics such as gender, indigenous movements, migration, urbanization, and tourism.

**ANTH 312. The Ancient Maya****3 Credits**

Archaeological evidence of culture change in the Maya civilizations of Mexico and Central America from 2000 BC to the Spanish Conquest.

**ANTH 313. Ancient Mexico****3 Credits**

Archaeological evidence of culture change among the Aztecs, Zapotecs, and their predecessors in Central Mexico and Oaxaca from 7,000 BC to the Spanish Conquest.

**ANTH 315. Introduction to Archaeology****3 Credits**

Concepts and methods for study of prehistoric cultures; history of archaeological research.

**ANTH 316. Archaeology of the American Southwest****3 Credits**

Introduction to the prehistoric peoples of the North American Southwest, a historical approach emphasizing the rise of method and theory in the region.

**ANTH 318. Historical Archaeology in Latin America****3 Credits**

Examination of theoretical and methodological issues in historical archaeology in Latin America from 1450 to present, including conquest, colonialism, capitalism, and modernity as anthropological processes. The contributions and limitations of historical, ethnohistorical, and archaeological evidence are emphasized.

**ANTH 320. Anthropological Linguistics****3 Credits**

The study of language and culture with particular emphasis on the cultural factors in the communication process.

**ANTH 330V. Magic, Witchcraft and Religion****3 Credits**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. Crosslisted with: HIST 330V and SOC 330V.

**ANTH 345. Introduction to Museology****3 Credits**

Museum philosophy, history, administration, and collection management. Emphasis on cataloging, care, and exhibition, as well as ethics and public responsibility.

**ANTH 348. Museums & Society****3 Credits**

Examines theoretical frameworks that shape museum administration, exhibits and collections development. Examines themes of gender, space, place, multiculturalism, national and international politics in museum contexts.

**ANTH 350. Anthropological Theory****3 Credits**

This course introduces students to historical and contemporary theory in anthropology with a focus on understanding why theory matters in our discipline. Key questions the course explores include: How have anthropologists thought about the concept of culture in different ways throughout the history of anthropology? What is the relevance of anthropological theory, both inside and outside the discipline? What new and promising trajectories do we see in anthropological theory today?

**ANTH 355. Physical Anthropology****3 Credits**

An introduction to primate behavior, human evolution, and physical variation in modern human populations.

**ANTH 357V. Medical Anthropology****3 Credits**

This course introduces students to evolutionary, ecological, interpretive, political-economic, and applied anthropological perspectives on health, illness, and healing to address some of the major questions in the field. How do humans adapt to changing environments that bring with them new illnesses and diseases? How do anthropologists understand the multiple meanings of health and illness cross-culturally? How can anthropologists effectively study health inequalities? What can medical anthropological perspectives contribute to addressing the health issues that we face in our current global context?

**ANTH 360V. Food and Culture Around the World****3 Credits**

Study of the interaction between food and human culture from an anthropological perspective. Examines the traditional role of food in local economies, social relations, and identity around the world. Also examines the impact of globalization on traditional food systems and cultures.

**ANTH 362. Environmental Anthropology****3 Credits**

This course examines ecology and current environmental studies from an anthropological point of view. The class focuses on how cultural values mediate environmental management. The class will cover topics such as theoretical foundations of ecological anthropology, large scale development, biodiversity conservation, sustainable environmental management, indigenous groups, consumption and globalization.

**ANTH 376. Lithic Technology Organization****3 Credits**

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data.

**Prerequisite(s):** ANTH 315.

**ANTH 378. Introduction to Lab Methods in Archaeology****3 Credits**

Laboratory techniques used in the analysis of archaeological materials.

**ANTH 385. Internship in Anthropology****3-12 Credits (3-12)**

Applied or field experience to gain professional expertise. Placements with public agencies, NGOs, or research organizations. Topical focus tailored to student's individual needs through consultation with instructor.

**Prerequisite(s):** Junior status, consent of instructor and GPA 2.8 or better.

**ANTH 386. Anthropological Study Odyssey****3-6 Credits (3-6)**

This course allows students to explore an anthropological topic, such as an archaeological tradition or culture, through classroom and field activities. Students are initially exposed to a topic during several days of intensive in class work and then pursue greater understanding of the topic through a field trip and possibly limited fieldwork. Readings, site tours, on-site lectures by specialists, and field exercises provide students an opportunity to develop an understanding of anthropological perspectives on the topic as well as to provide exposure to anthropological field and analytic methods. This course also allows students to experience other cultures, prehistoric sites, and/or locales firsthand. May be repeated for credit under a different odyssey title. Taught with ANTH 521. May be repeated up to 6 credits. Consent of Instructor required.

**ANTH 388. Intermediate Archaeological Field School****2-6 Credits (2-6)**

Training in archaeological field methods, including excavations of prehistoric sites, record keeping, mapping and analysis of data. Consent of Instructor required.

**ANTH 389. Archaeological Mapping****3-6 Credits (3-6)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software.

**ANTH 399. Professionalism & Practice in Anthropology****3 Credits**

Capstone course for seniors designed to allow students to synthesize the anthropological knowledge they have acquired and connect theory to application in preparation for entry into a career. Restricted to: ANTH majors.

**ANTH 402. Contemporary Medical Anthropology****3 Credits**

This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health inequalities, and the political economy of infectious disease. Taught with ANTH 546. May be repeated up to 3 credits.

**Prerequisite(s):** ANTH 301 or ANTH 357V or consent of instructor.

**ANTH 404. Cultures of Africa****3 Credits**

Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental challenges such as deforestation are discussed. Taught with ANTH 504. Crosslisted with: HIST 404

**ANTH 415. Applied Anthropology****3 Credits**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 515.

**ANTH 419. Topics in Prehistoric Archaeology****3 Credits**

Specific subjects in prehistoric archaeology as announced in the Schedule of Classes. May be repeated up to 6 credits.

**ANTH 431. Nutritional Anthropology****3 Credits**

Evolutionary and cross-cultural perspective on human nutrition.

**ANTH 433. Women, Gender, and Culture****3 Credits**

Survey of the history of ideas about women and gender in the discipline of anthropology and a comparison of gender roles, relations, and ideologies across a range of cultures. Same as W S 433.

**ANTH 434. Human Evolution****3 Credits**

Overview of human biological evolution from the emergence of Miocene apes to modern human diaspora. May be repeated up to 3 credits. Crosslisted with: BIOL 434.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**ANTH 434 L. Human Evolution Laboratory****1 Credit**

Laboratory in human evolution, includes exercises and activities to learn the human fossil record. Crosslisted with: BIOL 434 L.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** ANTH 434.

**ANTH 449. Directed Reading****1-6 Credits**

Comprehensive reading on selected topics. May be repeated for a maximum of 6 credits.

**Prerequisite(s):** Upper division anthropology majors with consent of instructor.

**ANTH 449 H. Directed Reading Honors****1-3 Credits**

Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.

**ANTH 455. Federal Indian Policy****3 Credits**

Federal Indian policy and its impact on Native Americans. This course will provide basic understanding of how federal Indian policy impacts almost all activities and situations with Native Americans. Course will also look at issues such as sovereignty and how it impacts most interactions with tribal groups.

**ANTH 456. Native American Intersections in Museums****3 Credits**

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 556.

**ANTH 458. Sex, Reproduction and Birth****3 Credits**

This course examines pregnancy and birth practices cross-culturally, including such topics as gendered roles and responsibilities, pregnancy and birth as rites of passage, cultural concepts of personhood, global family planning initiatives, the medicalization of pregnancy and birth, and developing reproductive technologies. May be repeated up to 3 credits.

**Prerequisite(s):** ANTH 301 or ANTH 357V or consent of instructor.

**ANTH 459. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Crosslisted with: HIST 459

**ANTH 467. Archaeology of the American Southwest****3 Credits**

Description and analysis of prehistoric archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures.

**Prerequisite:** ANTH 315.

**ANTH 472. Primate Behavior and Ecology****3 Credits**

Survey of the social behavior and ecology of nonhuman primates. Crosslisted with: BIOL 472.

**ANTH 473. Primate Adaptation and Evolution****3 Credits**

Survey of the adaptations and evolutionary history of nonhuman primates. Crosslisted with: BIOL 423.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** ANTH 473 L when offered.

**ANTH 474. Human Osteology****3 Credits**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 424.

**ANTH 474 L. Human Osteology Lab****1 Credit**

Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: BIOL 424 L.

Recommend Prerequisite is ANTH 355 or equivalent.

**Corequisite(s):** ANTH 474.

**ANTH 477. Zooarchaeology****3 Credits**

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. May be repeated up to 3 credits.

**ANTH 485. Special Research Project****1-3 Credits**

Anthropological, archaeological, or museum field work or laboratory experience in academic, private, state, or federal agencies. Must spend 30 hours in a field, museum, or laboratory setting per credit hour earned. May be repeated up to 6 credits.

**Prerequisite(s):** Complete 12 ANTH credits and consent of instructor.

**ANTH 486. Community Engagement and Service Learning****3 Credits**

Course combines classroom instruction with a local community service project. Formal instruction component will examine social science research findings and perspectives on a locally relevant social issue or problem. In the service learning component, students will be trained and work on a local community service project. Students will develop field experience and methodological skills in community engagement. Projects and social issues may vary for different semesters.

**ANTH 488. Archaeological Field School Advanced****1-6 Credits**

Archaeological field methods, including excavations of prehistoric sites, record keeping, mapping and analysis of data. Consent of Instructor required.

**ANTH 497. Special Topics****1-6 Credits (1-6)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** Junior or above standing.

**ANTH 500. Seminar in Anthropological Theory****3 Credits**

Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 502. Fundamentals of Anthropology****1-4 Credits (1-4)**

Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. Graded S/U.

**ANTH 504. Cultures of Africa****3 Credits**

Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental challenges such as deforestation are discussed. Taught with ANTH 404. Crosslisted with: HIST 504

**ANTH 505. Issues in Anthropological Practice****3 Credits**

Anthropological approaches to research design, implementation, and dissemination. Restricted to: Main campus only.

**ANTH 506. Advanced Studies in Physical Anthropology****1-3 Credits**

Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 507. Advanced Studies in Archaeology****1-3 Credits**

Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 508. Advanced Studies in Cultural Anthropology****1-3 Credits**

Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.

**Prerequisite(s):** graduate standing in Anthropology or consent of instructor.

**ANTH 509. Advanced Studies in Anthropological Linguistics****1-3 Credits**

Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.

**ANTH 512. Analytical Methods in Anthropology****3 Credits**

Quantitative analytical methods of anthropology examined in detail. Applied problem sets include physical and cultural anthropology, linguistics, and archaeology.

**Prerequisite:** graduate standing or consent of instructor.

**ANTH 513. Biological Anthropology****3 Credits**

Examination of major theoretical and methodological issues in biological anthropology.

**ANTH 515. Applied Anthropology****3 Credits**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.

**ANTH 516. Advanced Archaeology of the American Southwest****3 Credits**

Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.

**ANTH 517. Advanced Topics in Mesoamerican Archaeology****3 Credits**

Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**Prerequisite:** graduate standing.

**ANTH 518. Advanced Historical Archaeology****3 Credits**

Advanced methodological and theoretical concepts applicable to the archaeology of historic periods.

**ANTH 519. Advanced Topics in Prehistoric Archaeology****3 Credits**

Seminar on specialized research archaeology.

**Prerequisite:** graduate standing.

**ANTH 520. Ethnographic Field Methods****3 Credits**

Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.

**ANTH 521. Advanced Anthropologist Study Odyssey****3-6 Credits (3-6)**

This course allows students to explore an anthropological topic, such as an archaeological tradition or culture, through classroom and field activities. Students are initially exposed to a topic during several days of intensive in class work and then pursue greater understanding of the topic through a field trip and possibly limited fieldwork. Readings, site tours, on-site lectures by specialists, and field exercises provide students an opportunity to develop an understanding of anthropological perspectives on the topic as well as to provide exposure to anthropological field and analytic methods. This course also allows students to experience other cultures, prehistoric sites, and/or locales firsthand. May be repeated for credit under a different odyssey title. Taught with ANTH 386. May be repeated up to 6 credits. Consent of Instructor required.

**ANTH 522. Archaeological Field School-Graduates****2-6 Credits**

Techniques of archaeological data collection, analysis, and interpretation. Emphasis on archaeological field work in the Southwest.

**ANTH 523. Archaeological Mapping****3-6 Credits (3-6)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software.

**ANTH 526. Conquest and Colonialism****3 Credits**

Examination of major theoretical and methodological issues in historical anthropology and archaeology of the Americas from AD1500 to present, including conquest, colonialism, capitalism, and modernity as anthropological processes. The contributions and limitations of historical, ethnohistorical, and archaeological evidence are emphasized.

**Prerequisite(s):** graduate standing in Anthropology or History or consent of instructor.

**ANTH 531. Issues in Nutritional Anthropology****3 Credits**

Evolutionary and cross-cultural perspective on human nutrition.

**ANTH 534. Advanced Human Evolution****3 Credits**

Advanced overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. May be repeated up to 3 credits. Crosslisted with: BIOL 534.

**ANTH 534 L. Advanced Human Evolution Lab****1 Credit**

Advanced laboratory in human evolution, includes exercises and activities to learn the human fossil record. Crosslisted with: BIOL 534 L.

**Corequisite(s):** ANTH 534.

**ANTH 537. Applied Medical Anthropology****3 Credits**

This course introduces students to applications of medical anthropological perspectives to health care, international development, public health, and health policy.

**ANTH 538. Plants, Culture, and Sustainable Development****3 Credits**

Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnoecology, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.

**ANTH 539. Culture and Foodways****3 Credits**

Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.

**ANTH 540. Cultural Resource Management****3 Credits**

Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.

**ANTH 541. Decolonizing Methodologies in Native American Studies****3 Credits**

This course utilizes decolonizing methodologies and praxis to gain insight into the complex effects of oppression and colonization. Critical and indigenous concepts are used to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Research theory and methodology such as community participatory action research that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people is emphasized.

**ANTH 542. Cultural Resource Management II****3 Credits**

Continuation of ANTH 540 to include the study of cultural resource management practices, research design, and completion of proposals in response to requests. Overview of management practices and budgeting of projects and specialized studies (geophysical investigations, National Register nominations).

**ANTH 543. Indigenous Ways of Knowing****3 Credits**

This course examines Indigenous knowledge and ways of knowing as a means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather than comparative analysis.

**ANTH 545. Advanced Museology I****3 Credits**

Museum philosophy, history, administration, and collection management. Emphasis on collecting, cataloging, care, and exhibition, as well as ethics, public responsibility, and grantsmanship.

**ANTH 546. Advanced Contemporary Medical Anthropology****3 Credits**

This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health inequalities, and the political economy of infectious disease. Taught with ANTH 402.

**ANTH 547. Museum Field Methods****3 Credits**

Basic methodologies used in conducting museum research away from the museum, including collections evaluation, collections acquisition, donor interviews, educational outreach, and development.

**ANTH 548. Museums & Society****3 Credits**

Examines theoretical frameworks that shape museum administration, exhibits and collections development. Examines themes of gender, space, place, multiculturalism, national and international politics in museum contexts.

**ANTH 556. Advanced Native American Intersections in Museums****3 Credits**

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 456.

**ANTH 559. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as GOVT 565 and HIST 559.

**ANTH 572. Advanced Primate Behavior and Ecology****3 Credits**

Advanced review of non-human primate social behavior and ecology. Crosslisted with: BIOL 572.

**ANTH 573. Advanced Primate Adaptation and Evolution****3 Credits**

Advanced review of non-human primate adaptation and evolution.

Crosslisted with: BIOL 503.

**Corequisite(s):** ANTH 573 L when offered.

**ANTH 574. Advanced Human Osteology****3 Credits**

Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 574.

**ANTH 574 L. Advanced Osteology Laboratory****1 Credit**

Laboratory for ANTH 574. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: BIOL 574 L.

**Corequisite(s):** ANTH 574.

**ANTH 576. Lithic Technology Organization****3 Credits**

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data. Consent of Instructor required.

**ANTH 577. Advanced Zooarchaeology****3 Credits**

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.

**ANTH 578. Advanced Lab Methods in Archaeology****3 Credits**

Examination of advanced laboratory techniques used in the analysis of archaeological materials.

**ANTH 579. Qualitative Data Analysis and Interpretation****3 Credits**

This course focuses on methods for qualitative data analysis, both computer-assisted and non-computer-assisted, and interpretation. It includes writing up data for academic articles or theses.

**ANTH 585. Method and Theory in Archaeology****3 Credits**

Focus on major methodological and theoretical aspects of contemporary archeology.

**ANTH 587. Field Work in Latin America****3-12 Credits**

Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. No S/U grading.

**Prerequisite:** consent of instructor.

**ANTH 596. Readings****1-6 Credits**

Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.

**ANTH 597. Internship****1-9 Credits**

Anthropological or archaeological internship in private, state, or federal agency. May be repeated for a maximum of 18 credits. Consent of instructor required. Restricted to ANTH majors.

**Prerequisite(s):** graduate standing.

**ANTH 598. Special Research Problems****1-6 Credits (6)**

Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required. Restricted to ANTH majors.

**Prerequisite(s):** graduate standing.

**ANTH 599. Master's Thesis****15 Credits**

Thesis. Consent of instructor required. Restricted to ANTH majors.

**Prerequisite(s):** graduate standing.

## ARCT-ARCHITECTURE (ARCT)

**ARCT 101. Introduction to Architecture****3 Credits (2+2P)**

This course provides students the tools and vocabulary to analyze, interpret, and discuss the built environment from the social, historical, perceptual, and technical determinants. Lectures and assignments will introduce students to the elements of current and likely future directions of architecture from experiential, aesthetic, structural, functional, and historical perspectives. The course will provide students with knowledge about the people and processes involved with professional issues of architectural practice. Students will be required to participate in individual and group presentations and projects, as well as compile a portfolio of their work completed in the course.

**ARCT 104. Introduction to Architectural Drawing****4 Credits (2+4P)**

This course is designed as an introduction to architectural drawing and design for students without prior experience in the fine arts. Students are guided through a series of spatial and analytical exercises that focus attention on not only how architects draw, but also the reasoning and processes embedded within the technique. Direct linkages with the Introduction to Architecture course provide exposure to a wide range of interconnected architectural concepts.

**ARCT 111. Architecture World History I****3 Credits (2+2P)**

A survey of the development of world architecture from the ancient era to the advent of the enlightenment in Europe. Major emphasis is on the visual, intellectual, cultural and technological aspects of the ancient and indigenous cultures of the classical and pre-modern world. Community Colleges only. Restricted to Alamogordo, Dona Ana and Grants campuses.

**ARCT 124. Global Issues and Sustainability****3 Credits**

This is a 'critical thinking' course. This course introduces students to global environmental issues (historic, present, and future), and the impact on tomorrow's design and construction professions. Issues will include, but shall not be limited to global warming, energy consumption, population, natural resource consumption, air and water quality, waste management, facilities operation management, politics, and facilities design & construction. Through extensive readings, research, dialogue, and debates, students will establish a personal position (opinion) on each of the topics covered. Guest speakers will also be invited. Students will develop reports and presentations on various related issues, as well as develop ideas for solutions to problems related to environmental issues. The impact on the design and construction industry, including 'Green Building' and 'LEED Accreditation and Certification/Criteria' will also be addressed on each issue. Restricted to Community Colleges only.

**ARCT 150. Orientation and Mentoring in Architecture-Construction-Engineering (ACE)****1-6 Credits (1-6)**

This course is intended for high school dual credit students and college/university students wishing to explore careers in Architecture, Construction, and Engineering(ACE), which includes the specific fields of Architectural, Civil, Mechanical, Structural, Interior, Landscape, Sustainability, Environmental. Course is co-taught by a college instructor in conjunction with mentors who are local professionals in the fields of ACE. Students receive one-on-one mentoring, lectures, demonstrations, and attend field trips to construction sites, offices of Architects, Engineers and Designers, etc. Students also engage in hands-on activities such as Design (Architectural, Civil, Mechanical, Structural, Interior, Landscape, Environmental), analysis, model building, software, and research topics related to the ACE fields, as well as Sustainability, Interior Design, Landscape Design, Construction Materials and Fabrication processes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**ARCT 154. Introduction to Architectural Design****3 Credits (2+2P)**

This course provides students who possess a basic background in architecture and architectural drawing with an introduction to architectural design. Students are guided through a series of spatial and analytical exercises that focus attention on two dimensional, three dimensional, and four dimensional design. This course will build on direct linkages to ARCT 101 and ARCT 104 to further students' exposure to interconnected architectural concepts of process, organizational strategies, and analysis of material methodology while utilizing abstract and practiced graphical architectural conventions. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Prerequisite(s):** ARCT 101 and ARCT 104.

**ARCT 170. Computers in Architecture****3 Credits (2+2P)**

Explore various software and photography techniques widely used in the architectural field. In addition to using industry standard CAD program as primary 2-d drafting tool, focus is to produce digital architectural models and renderings, presentation boards, and animations. Digital images will be produced and enhanced through basic techniques in photography and integration of various software. Both individual and group work will be required.

**ARCT 204. Architectural Design Studio I****5 Credits (1+8P)**

Enhancement of general graphic communication skills and introduction to fundamental design including exploration, development and defense of design concepts; structural order; 2D and 3D processes in manual and digital architectural graphic expression; model building; general communication and presentation techniques; and development of course portfolio. Course is Studio/critique-based with considerable amount of work/hours required. This course is designed to be taken during student's last year in the Pre-Architecture program at DACC. Consent of Instructor required. Restricted to Community Colleges only.

**Prerequisite(s):** Grade of B- or better in both ARCT 101 and ARCT 104.

**ARCT 210. Architectural Delineation I****3 Credits (2+2P)**

Introduction to visual literacy, architectural graphic communication, & basic analytical skills. Architectural concepts primarily explored through the application of technical drawing, descriptive geometry, & material manipulation; primarily black & white media.

**ARCT 211. Architectural World History II****3 Credits (2+2P)**

A survey of the development of world architecture from the enlightenment in Europe to the present. Community Colleges only. Restricted to Alamogordo, Dona Ana and Grants campuses.

**Prerequisite(s):** ARCT 111 or consent of instructor.

**ARCT 224. Sustainable Design in Architecture****3 Credits**

This course provides students with hands-on opportunity to increase their awareness in, and respond to the issues of responsible environmentally friendly building design by engaging in an integrated design process combining 'Traditional Design Process' with 'Sustainable Environmental Design' strategies. Students will expand their awareness of global environmental impacts due to design and construction, and gain knowledge in the industry's leading design 'tool' LEED (Leadership in Energy and Environmental Design) green building design rating system. LEED strategies will be utilized in the design of individual projects apply LEED in practical, individual design development, and develop an integrated building model utilizing the concept of BIM (Building Information Modeling). Such project development will require learning a basic design process and specific sequence including conceptual design, schematic design, design development and BIM (utilizing a BIM software such as REVIT, or AutoCad Architecture). Restricted to Community Colleges only.

**Prerequisite(s):** DRFT 109 or DRFT 165 or consent of instructor.

**ARCT 250. Construction Documents****3 Credits (2+2P)**

Basic use of CAD to produce residential, commercial, and industrial architectural working drawings, including floor plans, sections, foundation plans and details, exterior and interior elevations, framing plans, and site plans. Use and application of building and zoning codes, typical construction methods and materials, and accessibility requirements. Basic 3-D modeling, AIA layering standards, sheet layout, and construction document coordination. Pre/ Restricted to: Community Colleges only.

**Corequisite(s):** DRFT 109.

**ARCT 254. Architectural Design Studio II****5 Credits (1+8P)**

Advanced graphic communication, design, and 3D physical model representation. Focus on site analysis, programming and fundamental design issues of context, environment, program development and space planning, 2D and 3D design and presentation techniques. Course is 'Studio/critique-based' with considerable amount of outside work/hours required. This course is designed to be taken during student's last year in the Pre-Architecture program at DACC. Restricted to Alamogordo, Dona Ana and Grants campuses.

**Prerequisite(s):** Grade of C- or better in ARCT 204.

**ARCT 260. Architectural Delineation****3 Credits (2+2P)**

Continuation of ARCT 210 with an emphasis in color media.

**Prerequisites:** ARCT 210.

**ARCT 274. LEED Accreditation Exam Prep****3 Credits**

This course is intended for anyone in the construction or architectural design fields who is interested in learning more about green building and the LEED (Leadership in Energy and Environmental Design) strategies, and are also interested in learning about how to become LEED accredited. Overview of the LEED rating systems utilized in the design and operation of buildings, the various LEED building certifications, and accreditation requirements for professionals. Highlights include interpretation of the LEED Reference Guides, accepted strategies for meeting LEED certification, sample practice exams, integrated project delivery methods, and a practical approach to problem solving through the use of design problems. Restricted to Community Colleges only.

**ARCT 290. Special Topics****1-6 Credits**

Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**ARCT 291. Cooperative Experience****1-6 Credits**

Supervised cooperative work program. Student employed in approved occupation; supervised and evaluated by employer and instructor. Student meets weekly with instructor. Graded S/U.

**Prerequisite:** consent of instructor.

**ARCT 295. Professional Development and Leadership-AIAS****1-3 Credits**

As members and/or officers of student professional organizations, architecture students gain experience through undertaking leadership roles, participating in team building, and becoming involved in service to the community. Students can also gain actual work experience involving skills related to their field of study. Graded S/U.

## ART-ART (ART)

**ART 101G. Orientation in Art****3 Credits (2+3P)**

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.

**ART 110G. Visual Concepts****3 Credits (2+4P)**

Introduction to the philosophies of art, visual thinking, and principles of visual organization. Designed to give students a broad view of aesthetic traditions, ideologies, and techniques basic to the creation and evaluation of art. Principles and concepts are taught in a common lecture and applied in parallel small studio sections. For non-art majors only.

**ART 150. Drawing I****3 Credits (2+4P)**

Introduction to the skill of seeing through exercises that emphasize careful drawing from the still life and utilize a range of drawing materials and techniques. Outside assignments required. Intended for non-art majors on main campus. May be repeated up to 3 credits.

**ART 151. Drawing II****3 Credits (2+4P)**

Continued emphasis on drawing from observation by focusing on still life and other subject matter. Covers a range of materials, techniques and concepts. Outside assignments. Restricted to ART and ANVE/DFM majors.

**Prerequisite(s):** ART 150.

**ART 155. 2-D Fundamentals****3 Credits**

Introduction to two-dimensional space emphasizing visual elements and design principles as they apply to composition. A variety of materials are used in the studio projects and sketchbook exercises. Developing knowledge in vocabulary, color theory and skill in translating ideas into design are encouraged. Restricted to Community Colleges campuses only.

**ART 156. 3-D Fundamentals****3 Credits**

Compositional organization of three-dimensional space explored through a broad range of visual exercises. Resourceful and creative problem solving encouraged. Restricted to Community Colleges campuses only.

**ART 157. Color Theory****3 Credits (2+4P)**

Various color theories as they relate to compositional organization. Required for art education majors.

**ART 160. Computer-Based Illustration****3 Credits (2+4P)**

Introduction to the principles of computerized drawing and design. Using the basic concepts, drawing tools, and vocabulary of Adobe Illustrator.

**Prerequisite:** ART 150, ART 155, or consent of instructor.

**ART 161. Digital Imaging I****3 Credits (2+4P)**

Work with basic concepts, tools, and vocabulary of Adobe Photoshop to create effective visual communication. Includes selection tools, cloning, copying and pasting, color correction, image restoration, filters, and special effects. Community Colleges only.

**ART 163. Digital Graphics****3 Credits (2+4P)**

Importing and exporting images and text into various desktop publishing formats. Exploring imaging, drawing, and page layout applications.

Introduction to typography.

**Prerequisite:** ART 161.

**ART 165. Web Page Design****3 Credits (2+4P)**

Introduction to the creation of well-designed and organized Web sites. Emphasis on building creative but functional user-friendly sites. Introduction to HTML, Flash, Java Script, and Web-authoring software.

Community Colleges only. Same as OEPT 165.

**Prerequisite:** ART 161.

**ART 250. Introduction to Drawing****3 Credits (2+4P)**

Introduction to drawing with a focus on technical, structural, and methodological skills. Subjects include still life and live figure models.

**ART 252. Aspects of Drawing****2-3 Credits**

Continued work in drawing with emphasis on personal creative endeavor. Community Colleges only.

**Prerequisites:** ART 150, ART 151, and ART 250.

**ART 255. Introduction to Graphic Design****3 Credits (2+4P)**

Introduction to the principles of visual communication and digital media, letterforms, typography and identity marks. Projects produced using conventional and digital tools.

**ART 260. Introduction to Painting****3 Credits (2+4P)**

Introduction to basic skills of painting through various exercises that emphasize working from observation, images and imagination. May be repeated up to 3 credits.

**Prerequisite(s):** ART 250 or ART 150.

**ART 261. Painting Methods, Techniques and Applications****3 Credits (2+4P)**

The investigation of formal aspects of painting, an examination of painting techniques, and an exploration of various methodologies regarding form and content as applied to critical thinking skills through medium of paint.

**Prerequisite(s):** ART 150, ART 260.

**ART 262. Aspects of Painting****2-3 Credits**

Varied painting media: continued development of painting skills.

**Prerequisites:** ART 150, ART 155 (for art majors), ART 260, or consent of instructor.

**ART 265. Introduction to Sculpture****3 Credits (2+4P)**

Beginning sculpture students "explore space" while learning new processes and skills, including mold making, welding and woodworking.

**ART 267. Art Portfolio Preparation****3 Credits (2+4P)**

Refine general marketing strategies, personal portfolio and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional packages.

**Prerequisites:** ART 163, ART 269, and ART 272, or consent of instructor.

**ART 269. Advanced Computer-Based Illustration****3 Credits (2+4P)**

Design custom graphics and create special effects with filtering, special effects on type, graphing, technical illustrations, and three-dimensional drawing using Adobe Illustrator.

**Prerequisites:** ART 157, ART 160, and ART 161, or consent of instructor.

**ART 270. Introduction to Photography****3 Credits (2+4P)**

Introduction to the production of digital images within the context of contemporary art. Utilizes digital SLR cameras with an emphasis on basic camera operation, picture composition, image processing and digital workflow. A DSLR camera is required. May be repeated up to 3 credits.

**ART 272. Digital Imaging II****3 Credits (2+4P)**

Refining of individual creative styles and technical skills using Adobe Photoshop. Emphasis on input and output predictability, and working with large file productions. Community colleges only. Restricted to: Community Colleges only.

**Prerequisite(s):** ART 161.

**ART 275. Introduction to Ceramics****3 Credits (2+4P)**

Introduction to the technical processes and conceptual concerns of working with the ceramic material. Students will explore various methods of forming with earthenware to make both functional and expressive works out of clay.

**ART 276. Ceramics I, B****3 Credits (2+4P)**

Beginning ceramics, complementary half to ART 275. (ART 275 and ART 276 do not need to be taken consecutively.) Basic building techniques of coil, slab, and throwing are introduced. High-fire and low-fire clays are used.

**ART 280. Introduction to Printmaking****3 Credits (2+4P)**

Introduction to the field of printmaking through projects that focus on specific processes, such as relief, intaglio, collography, paper lithography, and a variety of transfer and stencil techniques. Students engage in several assignments that are collaborative, as well as individual projects designed for development of personal aesthetics.

**ART 285. Introduction to Metals and Jewelry****3 Credits (2+4P)**

Introduction to fundamental processes, design, and conceptual development for metal fabrication of jewelry and functional/non-functional objects.

**ART 286. Stained Glass****3 Credits (2+4P)**

Instruction in the fundamental fabrication and design techniques for stained glass. Introduction to visual decision making skills, historical, and critical issues of the medium. Community Colleges only.

**ART 294. Special Topics in Studio****1-3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.

**Prerequisite:** consent of instructor.

**ART 295G. Introduction to Art History I****3 Credits**

An introduction to the principles of art history within a chronological framework of the art of the Western World. All media will be discussed. From prehistoric times to the fourteenth century.

**ART 296G. Introduction to Art History II****3 Credits**

Continuation of ART 295, Art of the Western World from Late Gothic to the present. May be repeated up to 3 credits.

**ART 298. Writing in Art****3 Credits**

This reading- and writing-intensive course will introduce students to various approaches of writing about historical art.

**ART 300. Special Topics in Art History****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 305. Medieval Art****3 Credits**

History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ART 505.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 306. Medieval Manuscript Illumination****3 Credits**

History of manuscript production and illumination in Western Europe from the Early Christian period to the middle of the 16th century; taught with ART 506.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 310. Native American Art****3 Credits**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. Considers the artistic expression and the function of art in diverse cultural and environmental contexts.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of the instructor.

**ART 311. Art of China I: Neolithic to Song Dynasty****3 Credits**

Survey of the art of China from the neolithic period to the end of the Song dynasty. Non-majors welcome. May be repeated up to 3 credits. Crosslisted with: ART 511.

**Prerequisite(s):** ART 295G, 296G, and 298 or HIST 211G and HIST 212G or consent of instructor.

**ART 320. Art and Architecture in Pre-Columbian Meso-America****3 Credits**

Analysis of the art and culture of the Mesoamerican peoples before the arrival of Columbus in the New World. Includes an in-depth formal and historical analysis of architecture, sculpture, painting, pottery, and metal works of Mixtec, Toltec, Aztec, Maya, and other cultures and civilizations.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 321. Pre-Columbian Art and Architecture of the Andes****3 Credits**

Examines the arts and history of pre-Columbian Andean cultures in a cultural context. Analysis of architecture, sculpture, pottery, jewelry, textiles, and feather work.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 323. Italian Renaissance Art****3 Credits**

History of painting, sculpture and architecture in Italy from the 14th century to the end of the 16th century; taught with ART 523.

**Prerequisite(s):** ART 295G, ART 296G and ART 298 or consent of instructor.

**ART 325. Northern Renaissance Art****3 Credits**

History of painting, manuscript illumination and graphics in Northern Europe from the late 14th century to the mid-16th century; taught with ART 525.

**Prerequisite(s):** ART 295G, 296G, and 298 or consent of instructor.

**ART 328. Baroque Art and Architecture in Northern Europe****3 Credits**

Study of architecture, painting sculpture in Flanders, Holland, France, England, and Germany as indigenous developments and as reflections of the Italian Baroque.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 329. Survey of Western Architecture****3 Credits**

Survey of history of Western architecture from prehistoric time to the present.

**Prerequisite(s):** ART 295G, ART 296G, and ART 298 or consent of instructor.

**ART 330. Modern Architecture****3 Credits**

A survey of the history of Modern Architecture with focus given to major architects, monumental buildings, and building groups stressing construction techniques and style from the 18th century to the present.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 333. Baroque Art and Architecture in Italy, Spain, and Hispanic Latin America****3 Credits**

Concentration of Italian Baroque architecture, painting, and sculpture; and on Spanish painting, sculpture, and architecture, as well as the art and architecture of Spanish vice-royalties of the Americas.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 337. American Art to 1900****3 Credits**

Examines painting, sculpture, architecture and other arts in the United States from the colonial period to 1900 and places them within conceptual and historical contexts. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 338. Late Eighteenth- and Nineteenth-Century European Art****3 Credits**

History of painting, sculpture, architecture, and other arts created in Europe from 1789 to 1900. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 339. History of Photography****3 Credits**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 342. Twentieth-Century Art I, 1900-1945****3 Credits**

Examines themes and monuments of the Western world created between 1900 and 1945 and emphasizes the growth of modern and avant garde cultural practices.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 343. Twentieth-Century Art II, 1945-Present****3 Credits**

History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1945 to the present.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 350. Intermediate Drawing and Painting****3 Credits (2+4P)**

Intermediate drawing and painting course focusing on the following topics: Realism, Color, Narrative, and Abstraction. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

**Prerequisite(s):** ART 250 and ART 260, or consent of instructor.

**ART 354. History of Graphic Design****3 Credits**

This course introduces students to the history of graphic design and evolution of visual communication. Course will involve writing and design projects.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 355. Special Topics in Graphic Design****3 Credits (2+4P)**

Intermediate graphic design course focusing on the following topics: production, packaging, layout, identity and interactive design. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

**Prerequisite(s):** ART 255 or consent of instructor.

**ART 360. The Figure****3 Credits (2+4P)**

Introduction to working from live models, anatomical skeletons, source images and the imagination in a variety of two-dimensional media, including painting and drawing. An emphasis is placed on anatomical accuracy and with a focus on the figure as an expressive subject. May be repeated up to 6 credits.

**Prerequisite(s):** ART 150, 250 or consent of instructor.

**ART 365. Intermediate Sculpture Special Topics****3 Credits (2+4P)**

Intermediate sculpture students will expand their fabrication skills in metal, wood and mixed media. Assignments incorporate topics such as Pop art, Process Art, and The Body in Contemporary Art. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 6 credits.

**Prerequisite(s):** ART 265 or consent of instructor.

**ART 370. Intermediate Digital Photography****3 Credits (2+4P)**

Intermediate digital photography course addressing techniques and production of photo media within the context of contemporary art. Course focuses on the following rotating topics: Networks, Photo-book and Video art. May be repeated up to 12 credits.

**Prerequisite(s):** ART 270, or consent of instructor.

**ART 373. Intermediate Analog Photography****3 Credits (2+4P)**

Introduction to skills and techniques of black and white film photography within the context of contemporary art. Emphasis on analog camera work and darkroom procedures. 35 mm SLR or rangefinder film camera required for course. May be repeated up to 6 credits.

**Prerequisite(s):** ART 270, or consent of instructor.

**ART 374. Intermediate Ceramics: Multiples (Design and Production)****3 Credits (2+4P)**

Intermediate ceramics course focusing on an introduction to the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. May be repeated up to 3 credits.

**Prerequisite(s):** ART 275 or consent of instructor.

**ART 375. Intermediate Ceramics: Sculptural Concerns****3 Credits (2+4P)**

Intermediate ceramics course focusing on the refinement of technical skills with an emphasis on conceptual development related to materiality.

**Prerequisite(s):** ART 275 or consent of instructor.

**ART 376. Museum/Gallery Research Internship****1-9 Credits**

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 380. Intermediate Printmaking****3 Credits (2+4P)**

Intermediate printmaking course with emphasis on further investigation of a variety of materials and techniques associated with the print processes of intaglio and relief. Stone lithography, serigraphy and mixed media will be introduced. May be repeated up to 6 credits.

**Prerequisite(s):** ART 280, or consent of instructor.

**ART 385. Intermediate Metals: Special Topics****3 Credits (2+4P)**

Intermediate Metals/Jewelry course focusing on the following topics: design and production, materiality and sculptural concern. Techniques may include casting, complex construction, forming, and mix media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 6 credits.

**Prerequisite(s):** ART 285 or consent of instructor.

**ART 390. Visual Culture of the 1960s****3 Credits**

Focus on major cultural trends and historical events in 1960's America. Offers analysis of art, films, and pop culture phenomena of the period.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 392. Visual Culture of the 1980s****3 Credits**

Focus on major cultural trends and historical events in 1980's America. Offers analysis of art, films, and pop culture phenomena of the period.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 394. Special Topics in Studio****3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes online. Topics cannot be repeated. May be repeated up to 9 credits.

**ART 401. Museum Conservation Techniques I****3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. Crosslisted with: ART 501.

**ART 402. Museum Conservation Techniques II****3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ART 502.

**Prerequisite(s):** ART 401.

**ART 403. Preventative Conservation/Collections Care****3 Credits**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ART 503.

**ART 444. Art and Life in Renaissance Italy****3 Credits**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself. 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, titian, humanism, the Medici, and republican and courtly culture.

**Prerequisite(s):** ART 295G, ART 296G, ART 298, or consent of instructor.

**ART 450. Advanced Drawing and Painting: Special Topics****3-6 Credits (2-4+4P)**

Advanced drawing and painting course focusing on the following topics: Identity, Place, Spirituality, and Body. Topics will be announced in the course schedule. May be repeated up to 12 credits.

**Prerequisite(s):** 12 credits of ART 350, or consent of instructor.

**ART 455. Advanced Graphic Design Special Topics****3-6 Credits (3-6)**

Advanced graphic design course focusing on the following topics: visual communication, system graphics, typography, portfolio preparation, art of the book and professional practice. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 15 credits.

**Prerequisite(s):** 6 credits of ART 355, or consent of instructor.

**ART 465. Advanced Sculpture Special Topics****3-6 Credits (2-4+4P)**

Thematic classes deepen students' knowledge of contemporary sculpture and extended media through a series of interpretive assignments that culminates in a unified body of work. Course topics include: "Artists' Maps", Installation Art/Land Art", "Sculpture and the 1960s", "Sculpture and the 1970's". Topics will be announced in the course schedule. May be repeated up to 18 credits.

**Prerequisite(s):** ART 365 or permission of the instructor.

**ART 470. Advanced Digital Photography****3 Credits (2+4P)**

Advanced digital photography course addressing technique and production of photo media within the context of contemporary art. Course focuses on the following rotating topics: Temporality, Photo-installation and Video Art. Each topic may only be taken once. May be repeated up to 12 credits.

**Prerequisite(s):** ART 370 or consent of instructor.

**ART 473. Advanced Analog Photography****3 Credits (2+4P)**

Advanced photography course focused on skills and techniques of black and white film within the context of contemporary art. Course focuses on the following rotating topics: Large Format Tableau, Experimental Processes and Materials. May be repeated up to 12 credits.

**Prerequisite(s):** ART 370 and ART 373, or consent of instructor.

**ART 474. Advanced Ceramics Design and Production****3-6 Credits (3-6)**

Advanced ceramics course focusing on the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. Discussions may also include issues of professional practice, marketing, and branding. May be repeated up to 6 credits.

**Prerequisite(s):** ART 374 and ART 375, or consent of instructor.

**ART 475. Advanced Ceramics Sculptural Concerns****3-6 Credits (2-4+4P)**

Advanced ceramics course focusing on conceptual development as it relates the creation of a unified body of work. Topics may include discussions of advanced techniques, professional practices, and contemporary issues in ceramics. May be repeated up to 15 credits.

**Prerequisite(s):** ART 374 and ART 375, or consent of instructor.

**ART 476. Advanced Museum/Gallery Research Internship****1-9 Credits**

Advanced research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** ART 376.

**ART 477. Independent Research Problems in Art History****1-9 Credits**

Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required.

**Prerequisite(s):** ART 295G, ART 296G, ART 298 and one 300 level art history course and consent of instructor.

**ART 478. Seminar: Selected Topics in Art History****3 Credits**

Reading, research, and discussion of advanced problems. Topics will be announced in the course schedule. Each topic may be only taken once. Non-art/art history majors, contact instructor for consent. May be repeated up to 12 credits.

**Prerequisite(s):** ART 295G, ART 296G and ART 298, and one 300 level art history course.

**ART 479. Art Theory, Criticism, and Historiography****3 Credits**

Theories and methodologies in art history and art criticism. May be repeated up to 3 credits.

**Prerequisite(s):** ART 295G, ART 296G, ART 298 and one 300 level art history course and consent of instructor.

**ART 480. Special Topics in Printmaking****3-6 Credits (3-6)**

Special topics in printmaking. Emphasizing conceptual approaches to printmaking and development of individual content. Topics will be announced in the course schedule. May be repeated up to 18 credits.

**Prerequisite(s):** 6 credits of ART 380, or consent of instructor.

**ART 485. Advanced Metals: Special Topics****3-6 Credits (2-4+4P)**

Advanced Metals/Jewelry course focusing on the following topics: conceptual development and personal aesthetic and style, professional practices, contemporary issues in Metals/Jewelry, and senior exhibition. Techniques may include enameling, coloring, historical processes, and digital technology. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 18 credits.

**Prerequisite(s):** 6 credits of ART 385, or consent of instructor.

**ART 490. Museum Conservation Internship****1-6 Credits (1-6)**

The goal of this internship is to provide a student with a practical learning experience in preventative conservation techniques and policies so that they can relate what they have learned in the classroom from ART 403 Preventative Conservation/Collections Care to applied situations. It will provide the student an opportunity to learn skills and knowledge needing in working with museum collections. Tasks and projects will be assigned by the instructor. 3 credits required for BFA in Museum Conservation. May be repeated up to 6 credits.

**Prerequisite(s):** ART 403.

**ART 494. Special Topics in Studio****3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes online. May be repeated up to 9 credits.

**ART 495. Undergraduate Studio Thesis****3-6 Credits (3-6)**

Special research and independent study leading to undergraduate thesis exhibition. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ART 496. Fundamentals of Studio Management****1 Credit**

Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.

**Prerequisite:** consent of instructor.

**ART 497. Readings in Art History****3 Credits**

In-depth study of art historical writing. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** ART 295G, ART 296G, ART 298 and one 300 level art history course.

**ART 499. Problems in Studio Art****1-6 Credits (1-6)**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 9 credits. Consent of Instructor required.

**ART 500. Special Topics in Art History****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

**Prerequisite(s):** Graduate status.

**ART 501. Museum Conservation Techniques I****3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. May be repeated up to 3 credits. Crosslisted with: ART 401.

**ART 502. Museum Conservation Techniques II****3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ART 402.

**Prerequisite(s):** ART 501.

**ART 503. Preventive Conservation/Collections Care****3 Credits**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ART 403.

**ART 505. Medieval Art****3 Credits**

History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ART 305.

**Prerequisite(s):** Graduate Standing.

**ART 506. Medieval Manuscript Illumination****3 Credits**

History of manuscript production and illumination in Western Europe from the Early Christian period to the middle of the 16th century; taught with ART 306. Consent of instructor required.

**Prerequisite(s):** ART 295G and ART 305 or ART 505.

**ART 510. Advanced Native American Art****3 Credits**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. The artistic expression and the function of art considered in diverse cultural and environmental contexts. Crosslisted with: ART 310.

**Prerequisite(s):** Graduate standing.

**ART 511. Art of China I: Neolithic to Song Dynasty****3 Credits**

Survey of the art of China from the neolithic period to the end of the Song dynasty. May be repeated up to 3 credits. Crosslisted with: ART 311.

**Prerequisite(s):** Graduate Standing.

**ART 520. Art and Architecture in Pre-Columbian Mesoamerica****3 Credits**

Analysis of the art and culture of the Mesoamerican peoples before the arrival of Columbus in the New World. Includes an in-depth formal and historical analysis of architecture, sculpture, painting, pottery and metal works of Mixtec, Toltec, the Aztec, Maya, and other cultures and civilizations. Crosslisted with: ART 320.

**Prerequisite(s):** Graduate standing.

**ART 521. Pre-Columbian Art and Architecture of the Andes****3 Credits**

Examines the arts and history of pre-Columbian Andean cultures in a cultural context. Analysis of their architecture, sculpture, pottery, jewelry, textiles, and featherwork. Crosslisted with: ART 321.

**Prerequisite(s):** Graduate standing.

**ART 523. Italian Renaissance Art****3 Credits**

History of painting, sculpture and architecture in Italy from the 14th century to the end of the 16th century; taught with ART 323.

**Prerequisite(s):** Graduate standing.

**ART 525. Northern Renaissance Art****3 Credits**

History of painting, manuscript illumination and graphics in Northern Europe from the late 14th century to the mid-16th century; taught with ART 325.

**Prerequisite(s):** Graduate standing.

**ART 530. Modern Architecture****3 Credits**

Study of the architecture of the later eighteenth, nineteenth and twentieth centuries in the context of technological, social and stylistic changes. Focus on the works of Louis Sullivan, Frank Lloyd Wright, and European architects of the International Style, and the current reaction. Crosslisted with: ART 330.

**Prerequisite(s):** Graduate standing.

**ART 533. Baroque Art and Architecture in Italy, Spain, and Hispanic Latin America****3 Credits**

Concentration on Italian and Spanish Baroque architecture, painting, and sculpture, as well as the art and architecture of Spanish vice-royalties of the Americas. Crosslisted with: ART 333.

**Prerequisite(s):** Graduate standing.

**ART 537. American Art to 1900****3 Credits**

Covers the history of painting, sculpture, architecture, and other arts in the United States from the colonial period to 1900. Crosslisted with: ART 337.

**Prerequisite(s):** Graduate standing.

**ART 538. Late Eighteenth- and Nineteenth-Century European Art****3 Credits**

History of painting, sculpture, architecture, and other arts created in Europe from 1789 to 1900. May be repeated up to 3 credits. Crosslisted with: ART 338.

**Prerequisite(s):** Graduate standing.

**ART 539. History of Photography****3 Credits**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. Crosslisted with: ART 339.

**Prerequisite(s):** Graduate standing.

**ART 542. Twentieth-Century Art I, 1900-1945****3 Credits**

History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1900 to 1945. Crosslisted with: ART 342.

**Prerequisite(s):** Graduate standing.

**ART 543. Twentieth-Century Art II, 1945-Present****3 Credits**

History of painting, sculpture, and other arts in Europe, the United States, and elsewhere from 1945 to the present. Comprehensive research paper required. Crosslisted with: ART 343.

**Prerequisite(s):** Graduate standing.

**ART 550. Drawing and Painting Workshop****3-6 Credits (2-4+4P)**

Graduate level drawing and painting course focusing on the development of concepts, expression and visual form. May be repeated up to 27 credits.

**Prerequisite(s):** Graduate standing.

**ART 555. Graphic Design****3 Credits**

May be repeated up to 27 credits.

**ART 560. Painting Workshop****3-9 Credits**

Advanced work with painting skills. Emphasis on critical analysis and development of body of work. May be repeated up to 27 credits.

**Prerequisite(s):** Graduate standing.

**ART 565. Sculpture Media****3-9 Credits**

May be repeated up to 27 credits.

**ART 570. Advanced Introduction to Photography****3-9 Credits**

Graduate students develop and implement a research program using photographic media and processes. Outcomes and program developed in consultation with photography faculty. May be repeated up to 30 credits.

**Prerequisite(s):** .

**ART 573. Non-Silver Photographic Processes****3 Credits**

Advanced work with historic photographic processes. Emphasis on creation of an extended body of work. Taught with ART 373. Consent of instructor required. Restricted to ART majors.

**Prerequisite(s):** ART 270, ART 271, ART 274.

**ART 575. Ceramic Arts****3-9 Credits**

May be repeated up to 27 credits.

**ART 576. Museum/Gallery Research Internship****1-9 Credits**

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. May be repeated for a maximum of 9 credits.

**Prerequisite:** graduate standing.

**ART 578. Seminar: Selected Topics in Art History****3 Credits**

Reading, research, and discussion of advanced problems. May be repeated for a maximum of 9 credits.

**Prerequisite:** graduate standing.

**ART 579. Graduate Seminar: Art Theory, Criticism, Historiography**  
**3 Credits**

Theories and methodologies in art history and art criticism.

**Prerequisite:** graduate standing.

**ART 580. Printmaking Workshop**  
**3-6 Credits**

May be repeated for a maximum of 33 credits.

**Prerequisite(s):** Graduate standing.

**ART 585. Metals and Jewelry Design**  
**3-9 Credits**

May be repeated up to 27 credits.

**ART 590. Visual Culture of the 1960s**  
**3 Credits**

Focuses on major cultural trends and historical events in 1960s America. Offers analysis of art, films, and pop culture phenomena of the period.

Fulfill all requirements of ART 390 plus graduate-level research.

**Prerequisite(s):** Graduate standing.

**ART 591. Visual Culture of the 1970s**  
**3 Credits**

Focuses on major cultural trends and historical events in 1970s America. Offers analysis of art, films, and pop culture phenomena of the period.

Fulfill all requirements of ART 391 plus graduate-level research.

**Prerequisite(s):** Graduate standing.

**ART 592. Visual Culture of the 1980s**  
**3 Credits**

Focuses on major cultural trends and historical events in 1980s America. Offers analysis of art, films, and pop culture phenomena of the period.

Fulfill all requirements of ART 392 plus graduate-level research.

**Prerequisite(s):** Graduate standing.

**ART 595. Problems in Studio**  
**1-6 Credits**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 12 credits. Consent of Instructor required.

**ART 596. Graduate Studio Seminar**  
**3 Credits**

Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form.

May be repeated for a maximum of 18 credits. Restricted to majors.

**Prerequisite(s):** Graduate standing.

**ART 597. Readings in Art History**  
**3 Credits**

In-depth study of historical writing about art. May be repeated for a maximum of 9 credits.

**Prerequisite:** graduate standing.

**ART 598. Studio Thesis**  
**1-15 Credits**

Special research in studio, leading to an exhibition and written thesis statement.

**ART 599. Art History Thesis**  
**1-15 Credits**

Art history master's thesis research. May be repeated for unlimited credit.

Restricted to masters level art history students. Consent of instructor required.

**Prerequisite(s):** Graduate standing.

## ASTR-ASTRONOMY (ASTR)

**ASTR 105G. The Planets**  
**4 Credits (3+2P)**

Comparative study of the planets, moons, comets, and asteroids which comprise the solar system. Emphasis on geological and physical processes which shape the surfaces and atmospheres of the planets.

Laboratory exercises include analysis of images returned by spacecraft.

Intended for non-science majors, but some basic math required. This lecture/lab course satisfies the New Mexico Common Core Area III: Lab Sciences requirement

**ASTR 110G. Introduction to Astronomy**  
**4 Credits (3+2P)**

A survey of the universe. Observations, theories, and methods of modern astronomy. Topics include planets, stars and stellar systems, black holes and neutron stars, supernovas and gaseous nebulae, galaxies and quasars, and cosmology. Emphasis on physical principles involving gravity, light and optics (telescopes). Generally non-mathematical.

Laboratory involves use of the campus observatory and exercises designed to experimentally illustrate principles of astronomy. This lecture/lab course satisfies the New Mexico Common Core Area III: Lab Sciences requirement.

**ASTR 199. Introduction to Astronomy Lab, Special**  
**1 Credit**

This lab-only listing exists only for students who may have transferred to NMSU having taken a lecture-only introductory astronomy class, to allow them to complete the lab requirement to fulfill the general education requirement. Consent of Instructor required. , at some other institution). Restricted to Las Cruces campus only.

**Prerequisite(s):** Must have passed Introduction to Astronomy lecture-only (e.g.

**ASTR 301V. Revolutionary Ideas in Astronomy**  
**3 Credits**

Examines recent fundamental scientific revolutions that have shaped our view of Earth and the universe. Topics in astronomy range from exoplanets to black holes to dark energy and raise questions about the very nature of how we use the scientific method to see the unseen, and how this shapes science research today.

**Prerequisite(s):** Any general education science course.

**ASTR 305V. The Search for Life in the Universe**  
**3 Credits**

Use of information from several of the sciences to explore the likelihood that life exists elsewhere in the universe. Subjects include an overview of historical ideas about the possibility of life elsewhere in the universe, the chemistry and biology of life on Earth, recent explorations for life within our solar system, and current search strategies for life in the universe and their scientific basis.

**ASTR 308V. Into the Final Frontier**  
**3 Credits**

Exploration of space: a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. Same as HON 308V.

**ASTR 330V. Planetary Exploration**  
**3 Credits**

A current planetary exploration mission is studied within the context of the solar system. The data acquired and principles involved in executing the mission, as well as political and economic implications of planetary exploration, are examined. Same as HON 330V. Main campus only

**ASTR 400. Undergraduate Research****1-3 Credits**

Supervised individual study or research. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**ASTR 401. Topics in Modern Astrophysics****3 Credits**

This course is designed for students interested in astrophysics who have some background in math and physics and want to learn about basic astrophysics and interesting current topics. The course will cover basic astrophysical concepts such as orbital mechanics, light, and radiative processes and transfer. These concepts will be applied to the discussion of exciting modern topics involving planets, exoplanets, stars, galaxies, and/or cosmology, with topical emphasis determined by the instructor.

**Prerequisite(s):** MATH 192G and (PHYS 213 or PHYS 215G).

**ASTR 402. Introduction to Astronomical Observations and Techniques****3 Credits**

Designed for students interested in astrophysics who have some background in math and astronomy and want to learn about techniques for obtaining and analyzing astronomical data. This course will review the properties of light and discuss the process of experimental design. The course will describe basic observational tools such as telescopes and detectors. It will discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for. Some topics in basic astronomical data analysis will be discussed, with topical emphasis determined by the instructor. Some simple data analysis projects will be assigned.

**Prerequisite(s):** MATH 191G and (PHYS 214 or PHYS 216G) and (ASTR 105G, ASTR 110G, or ASTR 401).

**ASTR 500. Seminar****1 Credit**

Organized group study treating selected topics.

**ASTR 506. Stellar Dynamics and Hydrodynamics****3 Credits**

Graduate level course on basic stellar dynamics and fundamentals of hydrodynamics.

**ASTR 535. Observational Techniques I (f)****3 Credits**

Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.

**ASTR 545. Stellar Spectroscopy****3 Credits**

This course covers the physics of stellar atmospheres with emphasis on using spectra as a diagnostic tool for understanding the properties of stars. Topics include spectral classification, radiative transfer, gas equilibrium physics, line and continuum opacities, adiabatic and superadiabatic convection, and extraction of observed quantities from spectra for deducing physical conditions of the source.

**ASTR 555. Galaxies I****3 Credits**

Fundamentals of the properties of galaxies and the components that they are made of stars and stellar populations, gas and dust, central black holes, and dark matter. Introduction to basic concepts of galaxy formation.

**ASTR 565. Stellar Interiors****3 Credits**

Internal constitutions of stars, computation of stellar models, and stellar evolution.

**ASTR 575. Computational Astrophysics****3 Credits**

Scientific programming for astronomical applications. Explore key algorithms and standard techniques for astronomical data analysis. Topics may include pointers, data structures, dynamic memory allocation, least squares fitting, grid and iterative search methods, LCG random number generators, Monte Carlo simulations, numerical integration, and astronomical image and spectrum manipulation. Applications to real astronomical datasets are emphasized.

**ASTR 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental.

**ASTR 599. Master's Thesis****15 Credits**

Master's level research in astrophysics or observational astronomy.

**ASTR 600. Pre-dissertation Research****1-15 Credits**

Research.

**ASTR 605. Interstellar Medium****3 Credits**

Basics of radiative transfer and processes in the interstellar medium. Properties of dust and infrared emission from grains. Applications to neutral atomic and molecular gas and ionized plasmas in galaxies. May be repeated up to 3 credits.

**ASTR 610. Radio Astronomy****3 Credits**

Techniques in observational radio astronomy, including single dish and interferometer arrays. Physical processes that produce radio emission, with a focus on continuum emission. May be repeated up to 3 credits.

**Prerequisite(s):** Consent of instructor.

**ASTR 616. Galaxies II****3 Credits**

Advanced topics in galaxies. Includes a detailed description and understanding of the Milky Way and topics in galaxy formation and evolution.

**ASTR 620. Planetary Surface and Atmospheric Processes****3 Credits**

Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.) May be repeated up to 3 credits. Restricted to: ASTR majors.

**ASTR 621. Planetary System Formation****3 Credits**

The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy. May be repeated up to 3 credits. Restricted to: ASTR majors.

**ASTR 625. Cosmology****3 Credits**

Discussion of our current knowledge of the structure of the universe and current research methods. Topics include the distance scale, clustering of galaxies, large-scale structure, metrics, dark matter, and cosmological probes such as distant quasars, radio galaxies, and gravitational lenses.

**ASTR 630. Numerical and Statistical Methods in Astrophysics****3 Credits**

Provides basic background in numerical and statistical methods relevant to astrophysical research. Topics include a review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, and other topics. May be repeated up to 3 credits.

**ASTR 670. Heliophysics****3 Credits**

Explore the Sun and its processes, the heliosphere, and its interactions with the planets. Topics include: A introductory description of space weather and its physics; energy interaction with the space environment; the quiet Sun and its interactions with planetary atmospheres (with an emphasis on Earth); Magnetohydrodynamics; frozen-in flux; the solar wind; magnetized fluid dynamics; the active Sun (flares and coronal mass ejections); the effects of Space Weather.

**ASTR 698. Special Topics.****1-9 Credits**

Special topics.

**ASTR 700. Doctoral Dissertation****15 Credits**

Dissertation.

## **AUTO-AUTOMOTIVE TECHNOLOGY (AUTO)**

**AUTO 102. Electrical Measuring Instruments****2 Credits (1+2P)**

Selection, operation, and care of electrical measuring instruments.

**AUTO 103. Auto Mechanics Fundamentals****4 Credits (2+4P)**

Theory and operation of all areas of auto mechanics. Basic repair and maintenance operations.

**AUTO 105. Welding****4 Credits (2+4P)**

Set-up and adjustment of oxyacetylene and arc welding equipment, identification of metals and rod application. Skill development in laying weld beads and different weld positions.

**AUTO 111. Automotive Mechanics Basics****4 Credits**

Basic maintenance procedures of the major components of the automobile using service repair manuals, hand and power tools, precision measurement equipment, fasteners and chemicals. Restricted to: Community Colleges only.

**AUTO 112. Basic Gasoline Engines****5 Credits (2+6P)**

Principles of gasoline engine operation. Identification, design, function of engine components; engine disassembly and reassembly; trouble shooting, and rebuilding heads.

**AUTO 113. Automotive Electricity and Electronics PT I****4 Credits (2+4P)**

Topics include mastery of DC electricity, use of digital multimeters, troubleshooting electrical problems in starting, charging and accessory systems. Restricted to Community Colleges only.

**AUTO 114. Automotive Electricity and Electronics PT II****4 Credits (2+4P)**

Advanced AC and DC automotive electronic circuits. Troubleshooting electronically controlled components including supplemental restraint systems and convenience accessories. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** AUTO 113. Restricted to Community Colleges campuses only.

**AUTO 115. Automotive Engine Repair****5 Credits (2+6P)**

Principles of gasoline engine operation. Identification of engine parts, operation, and function. Disassembly and reassembly. Engine problem diagnoses (cooling system, lubrication system, engine noises). Restricted to Community Colleges only.

**AUTO 117. Electronic Analysis and Tune-Up of Gasoline Engines****5 Credits (2+6P)**

Theory and operation of ignition and emission control systems and fuel system. Use of troubleshooting equipment and diagnostic equipment.

**Prerequisite:** AUTO 120 or consent of instructor.

**AUTO 118. Technical Math for Mechanics****3 Credits (2+3P)**

Mathematical applications for the automotive trade.

**AUTO 119. Manual Transmission/Clutch****5 Credits (2+6P)**

Manual transmission, transfer cases, and clutch operating principles. Students will diagnose problems, remove and replace, disassemble, repair, and assemble units.

**AUTO 120. Electrical Systems****4 Credits (2+4P)**

Troubleshooting and repair of starters, alternators, and associated circuits. Reading electrical diagrams, diagnosis and repair of electrical accessories.

**Prerequisite:** consent of instructor.

**AUTO 122. Automotive Brakes****4 Credits (2+4P)**

Focus is on theory, diagnosis, and service of drum, disc, and anti-lock braking systems, brake component machining, hydraulic component reconditioning, friction and hardware replacement. Restricted to Community Colleges only.

**AUTO 124. Automotive Heating and Air Conditioning****4 Credits (2+4P)**

R12 and R134A air conditioning systems maintenance diagnosis and repair. R12 to R134A conversion procedures. Troubleshooting automatic temperature controls and leak detection. Restricted to Community Colleges only.

**AUTO 125. Brakes****5 Credits (2+6P)**

Theory of operation, diagnosis, repair, and maintenance of disc and drum brakes; safety and use of special tools.

**AUTO 126. Suspension, Steering, and Alignment****5 Credits (2+6P)**

Types of steering systems, suspension maintenance and repair, four-wheel alignment procedures.

**AUTO 127. Basic Automatic Transmission****4 Credits (2+4P)**

Theory and operation of the automatic transmission; maintenance, troubleshooting, diagnosis, and repair of components.

**AUTO 129. Automotive Steering and Suspension****4 Credits (2+4P)**

Diagnosis/service of suspension components including shocks, springs, ball joints, manual and power steering systems and four wheel alignment are some areas covered. Restricted to Community Colleges only.

**AUTO 130. Introduction to Transportation Industry****3 Credits**

State and national traffic statutes that relate to the trucking industry. A Commercial Driver's License Learner's Permit will be obtained through successful completion of the course.

**Prerequisite(s):** Must be 18 years of age, have a current driver's license and consent of instructor.

**AUTO 131. Class A CDL****3 Credits (1+4P)**

Instruction in how to perform proper pre-trip inspection; hands-on training with a tractor-trailer unit on the backing range and street driving to develop skills necessary to pass Class A DCL exam. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Class A CDL restricted license (permit) and either restriction of D.O.T.

**AUTO 132. Automotive Air-Conditioning and Heating Systems****4 Credits (2+4P)**

Theory and operation, reading schematic diagrams, troubleshooting, repair, and replacement operations performed.

**AUTO 137. Fuel Systems and Emission Controls****4 Credits (2+4P)**

Covers theory and operation of fuel system and emission control. Troubleshooting, vacuum diagrams, overhaul, repair and adjustment of carburetion and fuel injection.

**Prerequisites:** AUTO 117 or consent of instructor.

**AUTO 139. Automotive Computer Controls****4 Credits (2+4P)**

Same as OEPM 139.

**AUTO 161. Non-Structural Repair****4 Credits (2+4P)**

This basic auto body course is designed to develop the students understanding of general shop safety using hand tools, pneumatic tools and power tools. This course will also cover straightening fundamentals, plastic and composite repair, panel replacement, and adjustments.

**AUTO 162. Advanced Non-Structural Repair I****4 Credits (2+4P)**

This course will involve the students in all phases of minor non-structural collision damage repairs. It will encompass sheet metal repair, advanced panel replacement and alignment.

**Prerequisite(s):** AUTO 161.

**AUTO 163. Advanced Non-Structural Repair II****4 Credits (2+4P)**

This course is a continuation of AUTO 162 with emphasis in all phases of minor non-structural damage repair. The student will be instructed in sheet metal repair and panel alignment as well as the R&I of automotive glass and related components.

**Prerequisite(s):** AUTO 162.

**AUTO 164. Automotive Industry Collision Repair I****4 Credits (2+4P)**

This advanced course is a continuation of AUTO 161, 162, and 163.

This course will incorporate all areas of major non-structural collision damage repair. Through practical application the student will learn how to effectively repair all heavy collision damage using current I-CAR repair standards and procedures.

**Prerequisite(s):** AUTO 163.

**AUTO 165. Automotive Industry Collision Repair II****4 Credits (2+4P)**

This advanced course is a continuation of AUTO 164 with emphasis on time efficiency. This course will involve the student in all areas of major collision damage repair. The student will be exposed to all applicable I-CAR industry procedures and standards involved in sheet metal and composite panel repair.

**Prerequisite(s):** AUTO 164.

**AUTO 172. Introduction to Automotive Refinishing****4 Credits (2+4P)**

This course is designed to incorporate all aspects of surface preparation, paint safety, refinishing materials, and refinishing fundamentals. Students will receive instructions for the application of acrylic enamel and base coat/clear coat refinishing systems.

**AUTO 174. Intermediate Automotive Refinishing****4 Credits (2+4P)**

This course encompasses all areas of surface preparation, damage repair and refinishing procedures that are necessary for achieving a proper spot repair. Students will also be exposed to safe work habits in the refinishing area and correct automotive detailing procedures.

**Prerequisite(s):** AUTO 172.

**AUTO 176. Automotive Color Adjustment & Blending****4 Credits (2+4P)**

This course will help develop the skills needed to match any type of paint. It will expose the student to color theory, color evaluation, color matching, and other color adjustment factors. The student will be instructed in multiple panel paint blending techniques as well.

**Prerequisite(s):** AUTO 174.

**AUTO 178. Automotive Overall Refinishing****4 Credits (2+4P)**

This course encompasses all areas of automotive refinishing. This advanced course is a continuation of AUTO 176 with emphasis in achieving industry refinishing times and standards consistent with that of I-CAR. The student will be exposed to surface preparation and refinishing techniques involved with overall coat/clear coat refinishing system.

**Prerequisite(s):** AUTO 176.

**AUTO 181. Frame and Structural Repair****4 Credits (2+4P)**

This course will involve the student in all areas of frame and structural damage repairs. Through theory and practical application, the student will learn how to diagnose and repair various types of damage include: mash, twist, sag, and side sway. This course will expose the students to safe work habits while using measuring and straightening equipment.

**Prerequisite(s):** AUTO 165.

**AUTO 182. Structural Panel Replacement****4 Credits (2+4P)**

This course is a continuation of AUTO 181 with infancies in structural panel replacement. The student will be exposed to frame and unibody measuring equipment and their proper use in sectioning procedures. Through theory and practical application the student will learn how to ID structural components, properly separate spot welds, position and weld new body panels in place.

**Prerequisite(s):** AUTO 181.

**AUTO 201. Engine Performance I****4 Credits (2+4P)**

Theory, function, service and analysis of engine related subsystems including ignition, fuel, starting, and charging systems. Emphasis is placed on diagnosis and operation of electronic engine control management systems. Restricted to Community Colleges only.

**AUTO 203. Engine Performance II****4 Credits (2+4P)**

Study of engine management systems and emission control systems, their function and relationship to vehicle performance and air pollution. Emphasis is placed on the analysis and repair of non-compliant vehicles. Restricted to Community Colleges only.

**AUTO 204. Engine Performance III****4 Credits (2+4P)**

Study of advanced level diagnostic test procedures and the equipment used to analyze OBD-II emission and drivability concerns. Use of Digital Storage Oscilloscopes, current ramping, Scan Tool analysis of 4 and 5 gas analyzers is mastered. Hybrid vehicles and the latest engine control systems are introduced. Restricted to Community Colleges only.

**AUTO 205. Manual Drive Train and Axles****4 Credits (2+4P)**

Operation, diagnosis, maintenance, repair or replacement of manual transmissions, clutch assemblies, differentials, drivelines, axles, and manual transaxles. Restricted to Community Colleges only.

**AUTO 206. Automatic Transmissions****5 Credits (2+6P)**

Operation, diagnosis, maintenance, and repair of automatic transmissions including rear wheel drive, front wheel drive, and electronically controlled transmissions and transaxles. Restricted to Community Colleges only.

**AUTO 208. Introduction to Alternative Fueled Vehicles****3 Credits**

Course will familiarize student with conditions that are resulting in the alternative fueled vehicle movement as well as the design and safety precautions unique to each alternative fuel. Propulsion systems covered include electric vehicles, bio-fueled vehicles, hybrid-electric vehicles and hydrogen powered vehicles, along with other emerging technologies as appropriate. Restricted to: Community Colleges only.

**Prerequisite(s):** AUTO 113 and AUTO 114.

**AUTO 209. Hybrid Vehicle Service Techniques****3 Credits**

Designed for experienced automotive technicians, this course will cover safety procedures, design, operational overview and service techniques as well as minor diagnosis and repair of all classifications of hybrid-electric vehicles. Each student must possess legal Class 'O' high voltage gloves and liners to attend this class. Restricted to: Community Colleges only.

**Prerequisite(s):** AUTO 113 and AUTO 114.

**AUTO 221. Cooperative Experience I****1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

**Prerequisite:** consent of instructor.

**AUTO 255. Special Problems in Automotive Technology****1-5 Credits**

Individual studies in areas directly related to automotive technologies. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**AUTO 295. Special Topics****1-6 Credits**

Topics to be announced in the Schedule of Classes.

## **AXED-AGRICULTURAL EXTN EDUC (AXED)**

**AXED 100. Introduction to Agricultural, Extension, and Technology Education****3 Credits**

Orientation to programs, philosophies, competencies and leadership skills needed by professionals in agricultural and technology education, extension education, agricultural communications, and related career opportunities in industry, governmental agencies, and international organizations.

**AXED 105. Techniques in Agricultural Mechanization****3 Credits (2+2P)**

Development of competencies in agricultural mechanics including safety, tool identification, operation and maintenance of hand and power tools, cold metal, drafting, and plumbing procedures. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

**AXED 200. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits toward degree.

**AXED 201G. Effective Leadership and Communication in Agricultural Organizations****3 Credits (2+2P)**

Theory and practice in leadership and communication for professionals who must work effectively in leadership and supervisory roles with people in agricultural business, industry, government agencies, and education. Course focuses on contemporary leadership theories. Oral communication skills in informative and persuasive speaking, parliamentary procedure, and for small groups are developed.

**AXED 205. Metal Technology-Fabrication****3 Credits (2+4P)**

Processes and procedures of metal fusion, including gas and electric welding techniques and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

**AXED 230. Early Field-Based Experience in Extension and Industry**  
**2 Credits (2)**

First Hand view of the roles of professional educators through field experiences with Cooperative Extension or other government agencies. Includes 4 weeks of classroom instruction and 30 hours of observation in a work setting. Consent of Instructor required. Restricted to Las Cruces campus only.

**AXED 232. Early Field-Based Experience in Agricultural and Technology Education**  
**2 Credits**

First-hand view of the roles of professional educators through field experiences in a secondary agricultural or technology education setting. Includes 4 weeks of classroom instruction and 30 hours of observations in a classroom setting. Consent of Instructor required.

**AXED 240. Introduction to Agricultural Communication**  
**3 Credits**

Students will learn about the history and theories of agricultural communications, be introduced to the degree program, explore careers in the field, and examine the role of media in agricultural communications

**AXED 300. Special Topics**  
**1-4 Credits**

Course addresses specific subjects and issues as identified by department. Topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits may be applied to a degree.

**AXED 303. Small Engine Technology**  
**3 Credits (2+2P)**

Development of competencies in small gasoline engines; theory, operation, design, maintenance and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

**AXED 331. Agricultural Structures**  
**3 Credits (2+3P)**

Selection and use of agricultural building materials. Design, construction, and maintenance of agricultural structures. Development of competencies in carpentry, concrete, electricity, masonry, and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

**AXED 348. Advanced Technology in the Agricultural Mechanization**  
**3 Credits (2+3P)**

Students will construct a project in the area of agricultural mechanization under the direction of instructor. Project must be completed within a semester and of sufficient complexity for 3 credits.

**Prerequisite(s):** AXED 105 and 205 or consent of instructor.

**AXED 360. Agricultural Communications**  
**3 Credits**

Principles and practical experience in news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities, especially as related to the fields of agriculture and family and consumer sciences.

**AXED 380. Philosophy and Methods of Contests**  
**3 Credits**

Covers the roles that career development events (contests) play in agricultural and technology education and in extension programs. Topics include competition and cooperation, winning and losing, ethics, use of community resources, and academic and employability skills taught through contests. Coaching as a teaching method is introduced and expanded. Students will assist with the coordination of various career development events. May be repeated up to 3 credits.

**AXED 400. The Diffusion and Adoption of Agricultural Innovations**  
**3 Credits**

Factors that influence the rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Same as AXED 500.

**AXED 415. Youth Program Development and Management**  
**3 Credits**

Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations.

**AXED 430. Teaching Adults in Nonformal Settings**  
**3 Credits**

The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education.

**AXED 436. Keys for Agricultural and Rural Development**  
**3 Credits**

Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally.

**AXED 443. Curriculum Development and Assessment in Agricultural Education**  
**3 Credits**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers. Restricted to: AXED majors.

**Prerequisite(s):** 2.5 GPA.

**AXED 444. Planning and Methods in Nonformal Education**  
**3 Credits**

Identifying trends and resources of a community and planning community-based extension and nonformal education programs. Preliminary methods for teaching and evaluating nonformal education programs.

**AXED 445. Developing Excellent Programs in Career and Technical Education**  
**3 Credits**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability for the program are discussed.

**AXED 446. Methods for Teaching Agricultural and Technology Education  
3 Credits**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Restricted to AXED Majors

**Prerequisite:** GPA of 2.5 or above.

**AXED 447. Directed Teaching in Agricultural or Technology Education  
15 Credits**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural or technology education supervising teachers. Consent of Instructor required. Restricted to: AXED majors.

**Prerequisite(s):** AXED 445, 446 and consent of instructor.

**AXED 448. Directed Teaching in Extension Education  
3-12 Credits (3-12)**

Four-to-fourteen-week, professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Consent of instructor required.

**AXED 449. Directed Field Experience in Agricultural or Technology Education  
3-12 Credits (3-12)**

Four-to-fourteen-week, supervised learning experience in an approved teaching setting with application to educational, agricultural, technological, communications, public relations, or environmental practices. Consent of instructor required.

**AXED 456. Introduction to Research Methods  
3 Credits**

Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search.

**Prerequisite:** junior standing.

**AXED 460. Methods in Career and Technical Laboratory Instruction  
2 Credits**

For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors.

**AXED 466V. John Muir: Lessons in Sustainability  
3 Credits**

This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influences his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable past.

**AXED 475. Leadership On Agricultural and Natural Resource Issues  
3 Credits**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings.

**AXED 480. International Agricultural Development  
3 Credits**

Introduction to Agricultural topics (products, people, environment, culture, etc) that affect international development. Topics provide students with awareness, knowledge and understanding of teaching, research and service opportunities for those seeking experience or careers in international agricultural development. Taught with AXED 580.

**AXED 484. Methods of Teaching Biological, Earth and Physical Sciences in Agriculture  
3 Credits**

Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered focus on incorporating biological, earth and physical sciences into agricultural instruction and may include: Tissue culture, animal anatomy, hydroponics microscopy, electrophoresis, microbiology, soils and plant nutrients, water quality, water systems, entomology, integrated pest management, and renewable energy applications. Students develop their own modules and/or experiments.

**AXED 486. Effective Management of Volunteer Programs  
3 Credits**

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention.

**AXED 488. 4-H Youth Development  
1 Credit**

On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension.

**AXED 489. The FFA Organization: An Overview  
1 Credit**

Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education.

**AXED 490. Independent Study in Agricultural, Extension, or Technology Education  
1-3 Credits**

Specific subjects are agreed upon by the student and instructor. May be repeated for a maximum of 6 credits.

**Prerequisites:** junior or senior standing and consent of instructor.

**AXED 499. Undergraduate Research  
1-4 Credits**

Research experience in agricultural, extension, and technology education with applications to selected issues and problems.

**Prerequisites:** consent of instructor.

**AXED 500. The Diffusion and Adoption of Agricultural Innovations  
3 Credits**

Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 400 with differential assignments for graduate students.

**AXED 515. Youth Program Development and Management  
3 Credits**

Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Same as AXED 415 with differentiated assignments for graduate students.

**AXED 525. Graduate Teaching Methods  
3 Credits**

Examines the teaching and learning process, emphasizing the use of appropriate methods for teaching career and technical education subjects to youth or adults in formal and nonformal educational settings. Includes principles of teaching and learning styles, levels of cognition, syllabus development, lesson planning, teaching using a variety of methods, and evaluating students. For students who have no prior education in teaching methods.

**AXED 530. Teaching Adults in Nonformal Settings  
3 Credits**

The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Same as AXED 430 with differentiated assignments for graduate students.

**AXED 536. Keys for Agricultural and Rural Development  
3 Credits**

Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally.

**AXED 543. Curriculum Development and Assessment in Agricultural Education  
3 Credits**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers. Restricted to: AXED majors.

**Prerequisite(s):** 2.5 GPA.

**AXED 544. Planning and Methods in Nonformal Education  
3 Credits**

Identifying trends and resources of a community and planning community-based extension and nonformal education programs. Preliminary methods for teaching and evaluating nonformal education programs. Same as AXED 444 with differentiated assignments for graduate students.

**AXED 545. Developing Excellent Programs in Career and Technical Education  
3 Credits**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Same as AXED 445 with differentiated assignments for graduate students.

**AXED 546. Methods for Teaching Agricultural and Technology Education  
3 Credits**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Same as AXED 446. Restricted to AXED Majors

**Prerequisites:** GPA of 3.0 or above.

**AXED 547. Directed Teaching in Agricultural or Technology Education  
4-9 Credits (4-9)**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Consent of Instructor required. Restricted to: AXED majors.

**Prerequisite(s):** A teaching methods class and consent of instructor.

**AXED 548. Directed Teaching in Extension Education  
4-9 Credits (4-9)**

Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Same as AXED 448 with reduced credit hours for graduate students. Restricted to majors. Main campus only.

**Prerequisite:** consent of instructor.

**AXED 549. Directed Field Experience in Agricultural or Technology Education  
4-9 Credits (4+9P)**

A four-to-fourteen-week supervised learning experience in an approved teaching setting with application to educational, agricultural, technological, communications, public relations, or environmental practices. Same as AXED 449 with reduced credit hours for graduate students. Restricted to majors. Main campus only.

**Prerequisite:** consent of instructor.

**AXED 556. Research Methods  
3 Credits**

Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. Same as FCSC 556.

**AXED 565. New Mexico Water Issues  
3 Credits**

Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated.

**AXED 571. Data Collection and Analysis  
3 Credits**

Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended.

**AXED 575. Leadership on Agricultural and Natural Resource Issues**  
**3 Credits**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students.

**AXED 580. International Agricultural Development**  
**3 Credits**

Introduction to agricultural topics (products, people, environment, culture, etc.) that affect international development. Topics provide students with awareness, knowledge and understanding of teaching, research, and service opportunities for those seeking experience or careers in international agricultural development and education. Taught with AXED 480.

**AXED 586. Effective Management of Volunteer Programs**  
**3 Credits**

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. Taught with AXED 486 with differentiated assignments for graduate students.

**AXED 590. Special Topics**  
**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 6 credits toward degree.

**AXED 594. Workshops in Agricultural, Extension, and Technology Education**  
**1-3 Credits**

Workshop procedures applied to current trends in agricultural, extension, and technology education. Maximum of 7 credits toward a degree.

**AXED 595. Internship/Cooperative Experience**  
**1-6 Credits**

Supervised professional on-the-job learning experience. Maximum of 6 credits toward a degree.

**Prerequisite:** Consent of instructor.

**AXED 598. Creative Component**  
**1-4 Credits**

For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. Maximum of 6 credits toward a degree.

**Prerequisite:** consent of instructor.

**AXED 599. Master's Thesis**  
**1-6 Credits**

Thesis.

## **B A-BUSINESS ADMINISTRATION (B A)**

**B A 104. Introduction to Business**  
**3 Credits**

Survey and integration of functions in business organizations within their social and economic environment. Community Colleges only.

**B A 105. Special Topics**  
**1-3 Credits**

Current topics in business and economics.

**B A 202. Small Business Enterprise**  
**3 Credits**

Appraisal of business functions within the framework of a small business organization.

**B A 291. Business Administration and Economics Internship and Cooperative Education I**  
**1-3 Credits**

Introduction and applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience, and not by the work experience.

**B A 305. Leadership Training for COB Ambassadors**  
**1 Credit**

Leadership development for volunteers serving as COB student ambassadors, focusing on COB undergraduate business degree programs, NMSU student services, public speaking and public relations.

**B A 391. Business Administration and Economics Internship and Cooperative Education II**  
**1-3 Credits**

Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.

**B A 490. Selected Topics**  
**3 Credits**

Prerequisites vary according to the seminar being offered.

**B A 498. Independent Study**  
**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisite:** junior or above standing and consent of instructor.

**B A 500. Macroeconomic Essentials**  
**1 Credit**

Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems. Restricted to: MBA Major majors majors.

**B A 501. Quantitative Tools for the MBA**  
**1 Credit**

An overview of critical topics in math and statistics that will provide a quantitative foundation for students entering the Master of Business Administration program. Admission to the MBA program.

**B A 550. Special Topics**  
**3 Credits**

Interdisciplinary seminar in selected current business topics.

**Prerequisite(s):** Prerequisites vary according to the seminar being offered.

**B A 590. Professional Paper/Presentation****3 Credits**

Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Restricted to: MBA majors.

**Prerequisite(s):** Minimum of 3.0 average in: ACCT 503, BLAW 502, FIN 503, and MKTG 503 or AEEC 551.

**B A 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 3 credits may be earned.

**Prerequisite:** consent of instructor.

**B A 599. Master's Thesis****15 Credits**

Thesis.

## BCHE-BIOCHEMISTRY (BCHE)

**BCHE 140. Introduction to Biochemistry****1 Credit**

A description of the nature of inquiry in biochemistry, especially with respect to the interaction of chemistry and biology. Both historical development and topics of current interest will be discussed. Graded S/U.

**BCHE 241. Introduction to Research in Biochemistry****1-3 Credits**

Techniques and procedures of biochemical research. May be repeated for a maximum of 3 credits.

**Prerequisites:** 8 credits of chemistry and 3.0 GPA in chemistry.

**BCHE 341. Survey of Biochemistry****4 Credits (3+3P)**

Basic principles of biochemical processes and the structure/function of the major classes of biomolecules, with introductions to metabolism and the central dogma of biochemistry. The chemical and biological properties of major biomolecules (DNA, proteins,

**Prerequisite(s):** C or better in CHEM 211 or CHEM 313.

**BCHE 395. Biochemistry I****3 Credits**

Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism.

**Prerequisite(s):** C or better in CHEM 314.

**BCHE 396. Biochemistry II****3 Credits**

Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 H.

**Prerequisite(s):** C or better in BCHE 395.

**BCHE 396 H. Biochemistry II Honors****3 Credits**

Taught with BCHE 396 with additional work required.

**BCHE 397. Experimental Biochemistry Laboratory****3 Credits**

Introduction to fundamental techniques used to explore structure and function of biological macromolecules such as proteins, carbohydrates, lipids, and nucleic acid. Course covers analyzing and reporting experimental data; enzymology; quantitative methods to determine biological molecules; basic principles of electrophoresis, chromatography, and spectroscopic immunochemistry.

**Prerequisite:** C or better in BCHE 395.

**Corequisite:** BCHE 396.

**BCHE 432. Physical Biochemistry****3 Credits**

This course focuses on modern Biophysical techniques used in protein and nucleic acid research. Topics are covered in some detail at the theoretical level. The course content is delivered entirely by podcast. Podcast contributions are from several different faculty from within their particular area(s) of expertise. Topics covered include (but are not limited to): biomolecular NMR, atomic force microscopy, light scattering, circular dichroism, ultracentrifugation, isothermal titration calorimetry, positron emission tomography, computerized tomography, ultrasound, functional MRI, protein fluorescence, mass spec/ proteomics, protein molecular dynamics simulations, and X-ray diffraction. Course credit qualifies for minor degree in chemistry as a physical-analytical chemistry emphasis. CHEM 431, or CHEM 433.

**Prerequisite:** One semester of undergraduate physical chemistry, e.g.

**BCHE 440. Biochemistry Seminar****1 Credit**

Introduction to current literature in biochemistry and molecular biology. Selected topics in the field will be presented by the faculty. Students will present written and oral reports from literature searches. Restricted to: BCHE majors.

**Prerequisite(s):** BCHE 395.

**BCHE 441. Advanced Research in Biochemistry****1-3 Credits**

Investigation of biochemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

**Prerequisites:** consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

**BCHE 446. Biochemistry III****3 Credits**

Intermediary metabolism of carbohydrates, lipids, amino acids, and nucleic acids. Metabolic pathways discussed with emphasis on biochemical regulation and mechanistic, structural, functional, and evolutionary basis for existence.

**Prerequisite(s):** BCHE 395 and either BCHE 396 or consent of instructor.

**BCHE 451. Special Topics****1-3 Credits**

Same as CHEM 451. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**BCHE 455. Independent Studies****1-3 Credits**

Independent studies directed by consulting faculty.

**Prerequisite:** consent of instructor.

**BCHE 494. Biochemical Genetics Laboratory****3 Credits (1.25+6P)**

Laboratory techniques required for experimentation with recombinant DNA such as nucleic acid isolation and purification, polymerase chain reaction (PCR), sequence analysis, and directed mutagenesis using genetic material from both prokaryotic and eukaryotic organisms. Consent of Instructor required.

**Prerequisite(s):** C or better in BCHE 395 and BCHE 396 or GENE 315, and consent of instructor.

**BCHE 540. Seminar in Biochemistry****1 Credit**

Formal seminar presentation in current topics in biochemical research. May be repeated for a maximum of 3 credits.

**BCHE 542. Biochemistry I****3 Credits**

Relationship between macromolecular structure and function. Basic enzymology. Energy metabolism.

**Prerequisite(s):** CHEM 314 and CHEM 431 or CHEM 433; or BCHE 395 or equivalent.

**BCHE 545. Molecular and Biochemical Genetics****3 Credits**

An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology. Same as BIOL 545.

**Prerequisite:** BCHE 542 or equivalent.

**BCHE 546. Biochemistry II****3 Credits**

Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation.

**Prerequisite:** BCHE 542 or BCHE 395 with consent of instructor.

**BCHE 590. Discussions in Biochemistry****1 Credit**

Current research problems in biochemistry. May be repeated for a maximum of 6 credits. S/U Grading (S/U, Audit).

**BCHE 598. Special Research Programs****1-3 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded S/U.

**BCHE 599. Master's Thesis****15 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 599.

**BCHE 600. Research****1-15 Credits**

May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.

**BCHE 647. Physical Biochemistry****3 Credits**

Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 451.

**Prerequisite(s):** 'C' or better in CHEM 431 or CHEM 433 or BCHE 542.

**BCHE 649. Topics in Biochemistry****1-3 Credits**

Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.

**BCHE 650. Advanced Seminar****1 Credit**

Discussion of biochemical research in progress that relates to a doctoral candidate's thesis research. Intended for students who have earned a master's degree or the equivalent and has made significant research progress for preparation of the doctoral dissertation. May be repeated for a maximum of 3 credits.

**BCHE 700. Doctoral Dissertation****20 Credits**

May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.

## BCIS-BUSINESS COMPUTER SYSTEMS (BCIS)

**BCIS 110. Fundamentals of Information Literacy and Systems****3 Credits**

Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communications, data analysis, information management and decision-making.

**BCIS 338. Business Information Systems I****3 Credits**

Application, design and use of computerized information systems in business environment.

**Prerequisite(s):** BCIS 110G or C S 110G or consent of instructor.

**BCIS 350. Information Systems Analysis and Design****3 Credits**

An introduction to the analysis and design of secure information systems.

**Prerequisite(s):** Concurrently with BCIS 338 or consent of instructor.

**BCIS 461. Business Analytics I****3 Credits**

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Crosslisted with: BCIS 561.

**Prerequisite(s):** BCIS 338 or consent of instructor.

**BCIS 466. Business Analytics II****3 Credits**

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Crosslisted with: BCIS 566.

**Prerequisite(s):** BCIS 461 or consent of the instructor.

**BCIS 475. Database Management Systems****3 Credits**

Design, development, and use of database management systems in the business environment.

**Prerequisite(s):** BCIS 338 or consent of instructor.

**BCIS 480. E-Commerce Security****3 Credits**

Introduction to securing network-based applications from internal and external threats. Fundamentals of network security, including TCP/IP, firewalls, intrusion detection, and vulnerability.

**Prerequisite(s):** BCIS 338 or consent of instructor.

**BCIS 482. Management of Information Security****3 Credits**

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security.

**Prerequisite(s):** BCIS 338 or consent of instructor.

**BCIS 485. Enterprise Resource Planning****3 Credits**

This course covers concepts in enterprise resource planning (ERP). Topics include how ERP integrates business processes across functional areas—such as the procurement process and the sales order process—and how businesses use ERP information systems in day-to-day operations as well as for performance monitoring. SAP R/3 software will be used in several hands-on examples of ERP software as a real-world example of an ERP system.

**Prerequisite(s):** C- or better in BCIS 338 or BCIS 350 or ACCT 351.

**BCIS 490. Selected Topics****1-3 Credits**

Current topics in business systems analysis. Consent of Instructor required.

**BCIS 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. May be repeated for a maximum of 3 credits.

**Prerequisites:** junior or above standing and consent of instructor.

**BCIS 502. Business Information Systems****3 Credits**

Analysis of information systems as integral parts of business organizations, including the responsibility of management to understand their capabilities and uses in handling the organization's information flow and providing appropriate information for decision making.

**Prerequisite:** graduate students only.

**BCIS 550. Information Systems Analysis and Design****3 Credits**

Information systems development methodologies and the system life cycle. Justifying and managing systems development projects. Taught with BCIS 350 with differentiated assignments for graduate students.

**Prerequisite(s):** Graduate Students Only.

**BCIS 561. Business Analytics I****3 Credits**

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Not open to students who have taken BCIS 461.

Taught with BCIS 461 with differentiated assignments for graduate students. No S/U or audit option. Crosslisted with: BCIS 461.

**Prerequisite(s):** BCIS 338 or consent of instructor.

**BCIS 566. Business Analytics II****3 Credits**

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Not open to students who have taken BCIS 466. Taught with BCIS 466 with differentiated assignments for graduate students. No S/U or audit option. Crosslisted with: BCIS 466.

**Prerequisite(s):** BCIS 461 or consent of the instructor.

**BCIS 575. Database Management Systems****3 Credits**

Design, development, and use of database management systems in the business environment. Taught with BCIS 475 with differentiated assignments for graduate students. Consent of Instructor required.

**Prerequisite(s):** BCIS 350.

**BCIS 580. E-Commerce Security****3 Credits**

Introduction to securing network-based applications from both internal and external threats. Fundamentals of network security including TCP/IP, firewalls, intrusion detection and vulnerability discussed. Not open to students who have taken BCIS 480. Taught with BCIS 480 with differentiated assignments for graduate students. No S/U or audit option.

**Prerequisite(s):** C- or better in BCIS 460 or consent of instructor.

**BCIS 582. Management of Information Security****3 Credits**

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Taught with BCIS 482 with differentiated assignments for graduate students.

**Prerequisite(s):** BCIS 110 or equivalent.

**BCIS 585. Enterprise Resource Planning & Business Processes****3 Credits**

Enterprise-wide information systems and their use in enterprise resource planning (ERP). This course will examine the many cross-functional business processes. Other topics include ERP implementation issues, change management, and business process re-engineering. Hands-on exercises use SAP/3 Enterprise software. Taught with BCIS 485 with differentiated assignments for graduate students.

**Prerequisite(s):** C- or better in ACCT 351 or BCIS 502 or consent of instructor.

**BCIS 590. Special Topics****1-3 Credits (1-3)**

Seminars in selected current topics in business computer systems. May be repeated up to 3 credits.

**Prerequisite(s):** Vary according to topic being offered.

**BCIS 598. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of department head. A maximum of 3 credits may be earned.

**Prerequisite:** consent of instructor.

# BCT-BUILDING CONSTRUCTION TECH (BCT)

## **BCT 100. Building Trades I**

**8 Credits (2+12P)**

Equipment and general safety. Human relations, building construction surveying, footings, foundation form work, framing, sheathing, insulation. Basic electrical wiring and plumbing. Classroom instruction, on-the-job training, and problem solving.

## **BCT 101. Introduction to Construction I**

**2 Credits (2+1P)**

Basic safety, including personal protective equipment, how to perform basic construction tasks safely, and what to do if an accident occurs. Includes basic construction methods. May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

**Corequisite(s):** BCT 102 and BCT 103.

## **BCT 102. Introduction to Construction II**

**2 Credits (2+1P)**

Introduction to power and hand tools, blueprints, and basic rigging hardware and techniques. May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

**Corequisite(s):** BCT 101 and BCT 103.

## **BCT 103. Introduction to Construction Laboratory**

**3 Credits**

Provides students the opportunity to practice skills they have acquired in BCT 101 and BCT 102. It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the National Center for Construction and Education Research (NCCER) Carpentry Program. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Corequisite(s):** BCT 101 and BCT 102.

## **BCT 104. Woodworking Skills I**

**3 Credits (1+4P)**

Use and care of hand tools and elementary power tools, safety procedures, and supervised project construction.

## **BCT 105. Woodworking Skills II**

**3 Credits (1+4P)**

Advanced woodworking skills to include use of advanced power tools, power tool safety, and supervised construction.

**Prerequisite:** BCT 104 or consent of instructor.

## **BCT 106. Woodworking Theory and Practice**

**3 Credits (2+2P)**

History of wood manufacturing, industrial techniques, wood characteristics, stains and finishes. Design and construction of minor wood projects.

## **BCT 107. Painting I**

**4 Credits (2+4P)**

Types and applications of paints and clear coatings. Use of fasteners, caulks, and sealants. Restricted to: Community Colleges only.

## **BCT 109. Plumbing I**

**3 Credits (2+3P)**

Covers orientation to the trade. Students will learn about materials used in the plumbing industry and the different types of plumbing fixtures. It includes task-oriented projects in which the students apply many of the skills and knowledge that are presented through the National Center for Construction and Education Research (NCCER) Plumbing Program. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** BCT 101, BCT 102. Restricted to Community Colleges campuses only.

## **BCT 110. Blueprint Reading for Building Trades**

**4 Credits (2+4P)**

Same as DRFT 151, OEET 101, OEPB 110.

## **BCT 111. Small Equipment Maintenance and Repair**

**4 Credits (2+4P)**

Covers small engine theory, troubleshooting and repair, auto maintenance, hydraulic theory and repair lubricants, batteries and scheduled tool maintenance. Restricted to: Community Colleges only.

## **BCT 114. Basic Carpentry**

**3 Credits (1+4P)**

Covers orientation to the trade; wood building materials, fasteners, and adhesives; detailed description and explanations of hand-operated and power tools, including safety; framing basics including laying out and constructing of wood floors, walls and ceilings and includes roughing in of door and window openings. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Corequisite(s):** BCT 115 and BCT 116.

## **BCT 115. Carpentry Level I**

**3 Credits (1+4P)**

Describes the various kinds of roofs and provides instructions for lay out of the different roofing systems. Describes the various types of windows, skylights, and exterior doors and provides instruction for installation. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Corequisite(s):** BCT 114 and BCT 116.

## **BCT 116. Basic Carpentry Lab**

**2 Credits**

Provides students the opportunity to practice skills they have acquired in BCT 114 and BCT 115. It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the National Center for Construction and Education Research (NCCER) Carpentry Program. May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

**Corequisite(s):** BCT 114 or BCT 115.

## **BCT 117. Plumbing 1A**

**3 Credits (2+2P)**

This course will introduce students to the plumbing profession. Students will become familiar with the tasks and responsibilities of plumbing professionals in the construction industry and gain a basic knowledge of the plumbing field. Restricted to Community Colleges campuses only.

## **BCT 118. Math for Building Trades**

**3 Credits**

Geometry, algebra, arithmetic, and basic trigonometry pertaining to mathematical applications in the building trades field. Same as OEET 118, DRFT 118, OEPB 118.

**Prerequisite:** CCDM 103 N.

**BCT 119. Plumbing 1B****3 Credits (2+2P)**

This course continues the introduction of students to the plumbing profession. Students will become familiar with the tasks and responsibilities of plumbing professionals in the construction industry and gain a basic knowledge of the plumbing field. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BCT 117.

**BCT 130. Professional Development and Leadership****1 Credit**

As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing or participating in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: BCT majors. S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

**BCT 150. Forklift Operation****1 Credit**

Classroom instruction and hands-on practice to prepare students to operate a forklift safely in the workplace. Students will have the opportunity to earn a forklift operator's permit. Consent of Instructor required. Restricted to Community Colleges campuses only.

**BCT 200. Building Trades II****8 Credits (2+12P)**

Continuation of BCT 100: roofing; exterior and interior finish; masonry; door, window, and cabinet installation.

**BCT 206. Advanced Cabinetmaking****3 Credits (1+3P)**

Advanced cabinetmaking skills, to include expert use of hand and power tools, professional construction and finishing techniques.

**Prerequisites:** BCT 105, BCT 106, or consent of instructor.

**BCT 209. Plumbing II****3 Credits (2+3P)**

Continuation of BCT 109. Provides students the opportunity to gain more practice in the skills and knowledge learned in Plumbing I. Students will install fixtures and run the various plumbing supply lines from Plumbing Level I. The course included hands on projects in which the students apply many of the competencies that have been presented through the National Center for Construction and Education Research (NCCER) Plumbing Program. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** BCT 109.

**BCT 217. Building and the Environment****3 Credits**

Introduction to LEED's, and Green Building Fundamentals, sustainability, sustainable design and green building evaluating cost implication of green building. Describes site development; managing site water runoff, improving a project's water use efficiency. Discusses renewable energy sources, and introduces student to generating power on-site using renewable energy sources, improving a building's indoor environment quality, improving the building industries' environmental performance and environmental aspects of building maintenance, re-use and conservation. Restricted to: Community Colleges only.

**BCT 218. Plumbing 2****4 Credits (2+4P)**

This course builds on the skills and knowledge students have gained in previous BCT introduction to plumbing courses, focusing on installation of plumbing systems. Students will become familiar with the tasks and responsibilities of plumbing professionals in the construction industry and gain a basic knowledge of the plumbing field.

**Prerequisite(s):** BCT 117 and BCT 119.

**BCT 219. Weatherization in Construction****3 Credits (2+2P)**

Introduction to industry weatherization standards and practices utilized in the construction of buildings for the purpose of energy conservation. Economic and environmental impacts of the use of energy in heating and cooling building will be examined.

**Prerequisite(s):** BCT 101, BCT 102 and BCT 103.

**BCT 221. Cooperative Experience I****1-4 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and is supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

**Prerequisite:** consent of instructor.

**BCT 222. Alternative Building****3 Credits (2+2P)**

Exploration of different types of building techniques and materials other than the traditional wood framed structures. Materials and techniques will include adobe, straw bale, insulated concrete forms, rammed earth and structural insulated panels with an emphasis on "green building" methods. Restricted to: Community Colleges only.

**BCT 255. Special Topics****1-6 Credits (1-6)**

Topics to be announced in the Schedule of Classes . May be repeated up to 12 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**BCT 290. Special Problems in Building Technology****1-4 Credits**

Individual studies in areas directly related to building technologies.

**Prerequisite:** consent of instructor.

## BIL-BILINGUAL EDUCATION (BIL)

**BIL 489. Topics****3 Credits**

Course subtitled in the Schedule of Classes. May be repeated three times for a maximum of 9 credits.

**BIL 505. The Bilingual Preschool Child****3 Credits**

Principles of multicultural education applied to preschool and primary levels. Focus on issues, methods, and materials.

**BIL 520. Issues in Schooling for Bilingual Learners****3 Credits**

Identification and consideration of current thought and directions in bilingual education, nationally and internationally.

**BIL 522. Literacy-Language Instruction for Bilingual Students****3 Credits**

Framework and strategies for developing the written language abilities of bilingual learners, with attention to the interrelationships among reading, writing, and oral language.

**BIL 545. Bilingual/Multicultural Schooling and Community Relations  
3 Credits**

Rationale, information pertinent to the school and the community in a setting involving economic, cultural, and linguistics diversity.

**BIL 550. Internship in Bilingual Education IV****1-6 Credits**

Advanced experience in educational bilingual settings for prospective bilingual education teachers. Maximum of 6 credits.

**BIL 560. Selected Topics in Bilingual Education III****1-6 Credits**

Various topics on current requests and needs in bilingual education. Maximum of 6 credits. BIL561. The Bilingual Exceptional Student 3 cr. Introduction to bilingual/multicultural special education. Same as SPED 561, SPED 661.

**BIL 570. Directed Study in Bilingual Education III****1-6 Credits**

Independent research topics in bilingual education based on particular individual interest or needs.

**BIL 616. Acquiring Emancipatory Discourses: TESOL/BIL****3 Credits**

An elaboration of understandings of bi- and multilingualism and related models of education based on current research and practice.

**BIL 617. Multiple Critical Literacies****3 Credits**

An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels.

**BIL 633. Praxis and Reflexivity****3 Credits**

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as ECED 633, EDUC 633, RDG 633, EDLT 633.

**Prerequisite:** consent of instructor.

**BIL 635. Critical Theory and Pedagogy****3 Credits**

Same as EDUC 635.

**BIL 670. Directed Study in Bilingual Education IV****1-6 Credits**

Independent research topics in bilingual education based on particular individual interest or needs.

## BIOL-BIOLOGY (BIOL)

**BIOL 101G. Human Biology****3 Credits**

Introduction to modern biological concepts. Emphasis on relevance to humans and their relationships with their environment. Cannot be taken for credit after successful completion of BIOL 111G or BIOL 211G. Appropriate for non-science majors. Requires successful completion of BIOL 101GL in order to meet the NM Common Core Area III Laboratory Science requirements.

**BIOL 101GL. Human Biology Laboratory****1 Credit**

Laboratory for BIOL 101G. Laboratory experiences and activities exploring biological concepts and their relevance to humans and their relationship with their environment.

**Prerequisite(s)/Corequisite(s):** BIOL 101G.

**BIOL 110G. Contemporary Problems in Biology****4 Credits (3+3P)**

Fundamental concepts of biology will be presented using examples from relevant problems in ecology, medicine and genetics. For nonscience majors only. Community Colleges only.

**BIOL 111G. Natural History of Life****3 Credits (3)**

Survey of major processes and events in the genetics, evolution, and ecology of microbes, plants and animals, and their interactions with the environment. Appropriate for science and nonscience majors. Must be taken with BIOL 111L to meet general education requirements. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** Currently enrolled in MATH 120, grade of C- or better in MATH 120, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 120.

**BIOL 111GL. Natural History of Life Laboratory****1 Credit**

Laboratory experiments, demonstrations and exercises on interrelationships among organisms, biodiversity, processes of evolution, and interaction of organisms and their environment. Appropriate for science and nonscience majors. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** BIOL 111G; Currently enrolled in MATH 120, grade of C- or better in MATH 120, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 120.

**BIOL 150. Topics in Biology****1-3 Credits (1-3)**

Introductory level coverage of biological topics. May be repeated up to 9 credits.

**BIOL 154. Introductory Anatomy and Physiology****4 Credits (3+3P)**

Survey of human structure and function (does not replace BIOL 190, BIOL 111G, or BIOL 211G as a prerequisite for advanced courses in biology). Restricted to: Community Colleges only.

**BIOL 211G. Cellular and Organismal Biology****3 Credits**

Principles of cellular structure and function, genetics, and organismal physiology. This course prepares the student for continuation in science or allied health fields. Suitable for all majors. Must be taken with BIOL 211L to meet general education requirements. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** a C- or better in MATH 120 or higher and a C- or better in CHEM 110G or CHEM 111G or CHEM 115.

**BIOL 211GL. Cellular and Organismal Biology Laboratory****1 Credit**

Laboratory demonstrations, experiments and exercises on molecular and cellular biology and organismal physiology. Must have passed BIOL 211G or be concurrently enrolled in BIOL 211G and BIOL 211L. Pre/ May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** a C- or better in BIOL 211G, MATH 120 or higher, and a C- or better in CHEM 110G or CHEM 111G or CHEM 115.

**BIOL 219. Public Health Microbiology****3 Credits**

The characteristics of pathogenic microorganisms and the diseases that they cause. Will not meet the microbiology requirements for biology or medical technology majors.

**Prerequisite:** BIOL 211G and BIOL 211GL.

**BIOL 221. Introductory Microbiology****3 Credits**

Principles of isolation, taxonomy, and physiology of microorganisms. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEM 110G or CHEM 111G or CHEM 112G.

**Corequisite(s):** BIOL 221 L.

**BIOL 221 L. Introductory Microbiology Laboratory****1 Credit**

A laboratory course to accompany BIOL 221 or BIOL 219.

**Prerequisite:** BIOL 221 or BIOL 219 or concurrent enrollment.

**BIOL 225. Human Anatomy and Physiology I****4 Credits (3+3P)**

The first in a two-course sequence that covers the structure and function of the human body, including terminology of the human gross anatomy, chemistry overview, cell structure, cell physiology (including DNA, protein synthesis and cell division). The organization of cells and tissues and their metabolic and homeostatic processes and regulation are also covered. Physical and chemical operation of organs and systems of the human body include the integumentary, skeletal, muscular, and nervous systems. Pre/ Restricted to: Community Colleges only.

**Corequisite(s):** CHEM 110G or CHEM 111G.

**BIOL 226. Human Anatomy and Physiology II****4 Credits (3+3P)**

The second in a two-course sequence that covers the structure and function of the human body. Includes the physical and chemical operation of the organs and systems of the human body, including endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary and reproduction system. Concepts of nutrition, metabolism, energy, fluid and electrolyte balance, heredity pregnancy and human embryonic and fetal development are also covered. Restricted to: Community Colleges only.

**Prerequisite(s):** BIOL 225, CHEM 110G or CHEM 111G.

**BIOL 227. Pathophysiology****3 Credits**

A study of the structure and function of the human body with specialized emphasis on disease processes.

**Prerequisite(s):** AHS 153 or BIOL 225 **Corequisite/Prerequisites(s):** AHS 154 or BIOL 226 **Restricted to:** Community Colleges only.

**BIOL 250. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits. Community Colleges only.

**BIOL 253. Human Anatomy****4 Credits (3+3P)**

Detailed presentations of human anatomy, with laboratory. For nursing, prenursing, and human nutrition and food science majors only. Restricted to: HNFS, PNUR majors.

**Prerequisite(s):** Grade of C- in BIOL 211G and either CHEM 111G or CHEM 110G.

**BIOL 254. Human Physiology****3 Credits**

Physical and chemical operation of the organs and systems of the human body. Not open to students who have passed BIOL 354 or BIOL 381.

**Prerequisite(s):** Grade of at least C- in BIOL 211G; BIOL 211GL; CHEM 111G or CHEM 110G.

**BIOL 262. Human Pathophysiology I****3 Credits**

The first in a two-course sequence that covers changes in body physiology that result from disease or injury. Includes a general introduction to pathophysiology as well as an overview of altered cellular and tissue biology, injury, inflammation, and neoplasia. Students will also explore deviation from fluid, hemodynamic, and endocrinologic balance. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of C- or higher in BIOL 225 and BIOL 226.

**BIOL 263. Pathophysiology II****3 Credits**

The second in a two-course sequence that covers changes in body physiology that result from disease or injury. This course focuses on the pathophysiology of the nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of C- or higher in BIOL 225, BIOL 226, and BIOL 262.

**BIOL 301. Principles of Ecology****3 Credits**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. MATH 191G and A ST 311 recommended. Same as E S 301. Crosslisted with: E S 301.

**Prerequisite(s):** BIOL 111G, MATH 121G.

**BIOL 302. Molecular Biology Techniques Laboratory****3 Credits**

This combined lecture and laboratory course emphasizes molecular biology laboratory practices through the hands-on application of commonly applied techniques, protocols, and equipment. The topics covered include both the fundamental development of empirical data as well as data analysis using stand-alone and web-based resources. Consent of instructor required.

**Prerequisite(s):** BIOL 211G or equivalent, and MATH 121G.

**BIOL 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: HORT 305 and AGRO 305.

**Prerequisite(s):** BIOL 111G and BIOL 211G, or BIOL 211G and BCHE 140, either CHEM 111G or CHEM 115, and MATH 121G.

**BIOL 309. Guided Biological Research Lab****3 Credits**

This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career undergraduates who have finished the introductory sequence of Biology courses. Topics will vary with instructor.

**Prerequisite(s):** BIOL 111G, BIOL 211G, and MATH 121G.

**BIOL 311. General Microbiology****3 Credits**

Principles of physiology, molecular biology, ecology, and taxonomy of microorganisms.

**Prerequisite(s):** BIOL 211G and MATH 121G.

**BIOL 311 L. General Microbiology Laboratory****2 Credits**

Microbiology techniques and procedures, including isolation and identification of microorganisms and biotechnology procedures that employ microorganisms.

**Prerequisite(s)/Corequisite(s):** BIOL 219 or BIOL 311. **Prerequisite(s):** BIOL 211G and MATH 121G.

**BIOL 312. Plant Taxonomy****3 Credits (2+3P)**

Classification and identification of representative plant families and local plants. Emphasis on ability to use technical sources. Saturday field trips may be recommended.

**Prerequisite(s):** BIOL 111G and MATH 121G.

**BIOL 313. Structure and Function of Plants****3 Credits (2+3P)**

Structure, function, and survey of plants. BIOL 211G recommended.

**Prerequisite(s):** BIOL 111G, MATH 121G, and sophomore-level standing.

**BIOL 314. Plant Physiology****3 Credits**

Photosynthesis, respiration, water relation of plants, minerals and organic nutrition, growth and development.

**Prerequisite(s):** BIOL 211G and CHEM 112G.

**BIOL 322. Zoology****3 Credits (2+3P)**

Structure, function, and survey of animals. BIOL 211G recommended.

**Prerequisite(s):** BIOL 111G, MATH 121G, and at least sophomore-level standing.

**BIOL 350. Special Topics****1-4 Credits**

Specific subjects announced in Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

**BIOL 351. Biology Internship****1-6 Credits**

Substantial off-campus experience in biology selected by student in consultation with regular biology faculty member. Internship must be approved by faculty member. Student will supply mutually agreed upon documentation of internship activities after the internship is completed. May be repeated up to 6 credits. Restricted to: BIOL, MBIO, CEC, GEBT majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** 45 college credits, 2.5 or better GPA, consent of instructor.

**BIOL 353. Pre-Professional Human Anatomy****4 Credits**

Pre-professional clinically-oriented survey of human anatomy. Designed primarily for pre-nursing majors. Provides comprehensive anatomical training for students planning careers in health and allied health sciences, such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. Suitable as a biology elective. Concurrent enrollment in BIOL 354L is recommended but not required.

**Prerequisite(s):** BIOL 211G and either CHEM 110G, CHEM 111G, or CHEM 115.

**BIOL 353 L. Pre-Professional Human Anatomy Laboratory****1 Credit**

Laboratory experience in human anatomy using anatomical models and cat dissections. Designed as a learning aid to support and augment BIOL 353 pre-professional Human Anatomy. For students planning careers in health and allied health sciences such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science.

**Prerequisite(s)/Corequisite(s):** BIOL 253 or BIOL 353. **Prerequisite(s):** BIOL 211G and either CHEM 110G, CHEM 111G, or CHEM 115.

**BIOL 354. Physiology of Humans****3 Credits**

Principles of integrative functions in humans. A systems approach emphasizing tissues, organs, and their regulation.

**Prerequisite(s):** BIOL 211G and MATH 121G.

**BIOL 354 L. Laboratory of Human Physiology****1 Credit**

Laboratory to accompany BIOL 354.

**Prerequisite(s):** MATH 121G and either BIOL 254, BIOL 381, BIOL 354, or concurrent enrollment in BIOL 354.

**BIOL 373. Fungal Biology****3 Credits (3+2P)**

Same as EPWS 372.

**Prerequisite:** EPWS 310 or BIOL 311 or consent of instructor.

**BIOL 377. Cell Biology****3 Credits**

Fundamentals of eukaryotic cell structure, organization, and function. Emphasis on membranes, subcellular organelle systems, cytoskeleton, and cell cycle. Includes basic aspects of molecular biology. May be repeated up to 3 credits. BIOL 111G recommended.

**Prerequisite(s):** (BIOL 211G, BIOL 305 or GENE 315) and MATH 121G.

**BIOL 381. Animal Physiology****3 Credits**

Principles of integrative function in animals, emphasizing tissues, organs, organ systems, and regulation. Includes adaptations of animals to their environments. BIOL 111G and BIOL 377 recommended.

**Prerequisite(s):** BIOL 211G and junior-level standing, MATH 121G.

**BIOL 382. Plant Signalling and Development****3 Credits**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 305 or GENE 315, and MATH 121G.

**BIOL 385. An Introduction to Cancer****3 Credits**

This course will cover 3 areas of cancer research and their interdisciplinary connections: clinical cancer research, epidemiology and public health, and basic cancer research. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 305 or GENE 315 or equivalent and MATH 121G.

**BIOL 398. Biology Research Programs****1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

**BIOL 402. Biology Honors Thesis****1-3 Credits (1-3)**

Provides guidance in how to write a scientific paper in the sciences. Students will produce an honors thesis based on previous independent research. Consent of instructor required.

**Prerequisite(s):** MATH 121G and consent of instructor.

**BIOL 408. Ecology of Plants****3 Credits**

Controlling factors, succession, community dynamics, and the classification of vegetation.

**Prerequisite(s):** BIOL 301 and MATH 121G.

**BIOL 412. Seminar in Microbiology****1 Credit**

Seminar to aid students in assessment and presentation of current topics in microbiology. Graded: S/U.

**Prerequisite(s):** BIOL 311, BIOL 311L, and MATH 121G.

**BIOL 417. Topics in Environmental Microbiology****3 Credits**

This is an advanced undergraduate course based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA, and the human microbiome. Crosslisted with: BIOL 577.

**Prerequisite(s):** MATH 121G, BIOL 477 or consent of instructor.

**BIOL 423. Primate Adaption and Evolution****3 Credits**

Survey of the adaptations and evolutionary history of non-human primates. Consent of Instructor required. Crosslisted with: ANTH 473 .

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 423L when offered.

**BIOL 423 L. Primate Evolution Laboratory****1 Credit**

Laboratory with exercises on non-human primate adaptation and evolution. Crosslisted with: ANTH 473 L.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 423.

**BIOL 424. Human Osteology****3 Credits**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Crosslisted with: ANTH 474.

**Corequisite(s):** BIOL 424L when offered.

**Prerequisite(s)/Corequisite(s):** Recommend ANTH 355 or equivalent.

**BIOL 424 L. Human Osteology Lab****1 Credit**

Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: ANTH 474 L.

**Prerequisite(s):** Recommend ANTH 355 or equivalent.

**Corequisite(s):** BIOL 424.

**BIOL 427. Symbiosis****3 Credits**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 111G, BIOL 211G, and MATH 121G.

**BIOL 434. Human Evolution****3 Credits**

Overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. Crosslisted with: ANTH 434.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 434L when offered.

**BIOL 434 L. Human Evolution Laboratory****1 Credit**

Laboratory in human evolution, includes exercises and activities to learn the human fossil record. Crosslisted with: ANTH 434 L.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** BIOL 434.

**BIOL 436. Disease Vector Biology****3 Credits**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Crosslisted with: BIOL 536

**Prerequisite(s):** BIOL 211G, BIOL 305, and MATH 121G.

**BIOL 442. Genomics Technology****3 Credits**

The course introduces current genomic techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics.

**Prerequisite(s):** BIOL 211G, BIOL 305 or BIOL 478 or GENE 315, and MATH 121G.

**BIOL 446. Bioinformatics and NCBI Database****3 Credits**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study.

**Prerequisite(s):** BIOL 211G, BIOL 305 or BIOL 478 or GENE 315, and MATH 121G.

**BIOL 450. Special Topics****1-3 Credits**

Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

**BIOL 451. Physiology of Microorganisms****3 Credits**

Aspects of cellular physiology unique to prokaryotes. BCHE 395 recommended.

**Prerequisite(s):** C- or better in BIOL 311, MATH 121G.

**BIOL 455. Biometry****3 Credits**

Biometry is the analysis of biological data using mathematical and statistical models. The course will cover basic theories of probability and statistics and will introduce principles of sampling, estimation, experimental design, and hypothesis testing. Students will analyze biological data using computer programs and will perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.

**Prerequisite(s):** BIOL 111G or BIOL 211G, and MATH 121G.

**BIOL 459. Darwinism Versus Creationism****3 Credits**

This course examines the debate regarding Creationism versus Darwinism as explanations for the origin and diversification of life on Earth. Topics covered include the nature and philosophy of science, new-world creationism, old-world creationism, intelligent design, history of evolutionary thought, modern evolutionary theory, and the Creationism-Darwinism debate at the societal, political, and educational interfaces. The course structure will include formal lectures and in-class discussion of assigned readings.

**Prerequisite(s):** BIOL 111G or BIOL 211G, and MATH 121G.

**BIOL 462. Conservation Biology****3 Credits**

Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally.

**Prerequisite(s):** BIOL 301 and either MATH 142G or MATH 191G.

**BIOL 465. Invertebrate Zoology****4 Credits (3+3P)**

Survey, ecology, behavior and physiology. BIOL 322 recommended.

**Prerequisite(s):** MATH 121G, BIOL 111G, and junior-level standing.

**BIOL 466. Invertebrate Zoology Field Trip****1 Credit**

A one-week field trip for the study of marine invertebrates. Registrants must provide own camping gear. Graded: S/U.

**Prerequisite(s):** MATH 121G, BIOL 465 or equivalent (or concurrent enrollment) or consent of instructor.

**BIOL 467. Evolution****3 Credits**

Covers theory, historical background, population variation, natural selection, adaptation, speciation.

**Prerequisite(s):** BIOL 111G, BIOL 305 or GENE 320, and MATH 121G.

**BIOL 469. Biology of Emerging Infectious Diseases****3 Credits**

This class will investigate the evolutionary and ecological drivers of disease emergence. The effect of emerging diseases on human health will be addressed throughout the class, but the class will also consider the consequences of disease emergence for the health of wildlife and plant populations. Additionally, the class will consider the mechanisms used to control disease emergence and why they succeed or fail.

**Prerequisite(s):** MATH 121G, Introductory Genetics (BIOL 305 or equivalent) or consent of the instructor.

**BIOL 470. Developmental Biology****3 Credits**

The purpose of this course is to introduce students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and, how changes in development provide the material basis for evolutionary change.

**Prerequisite(s):** BIOL 211G, BIOL 305, and MATH 121G.

**BIOL 472. Primate Behavior and Ecology****3 Credits**

Survey of the social behavior and ecology of nonhuman primates.

Crosslisted with: ANTH 472.

**BIOL 473. Ecology of Microorganisms****3 Credits (2+3P)**

The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes.

**Prerequisite(s):** MATH 121G, BIOL 311 or consent of instructor.

**BIOL 474. Immunology****3 Credits**

Basic concepts of the immune response.

**Prerequisite(s):** MATH 121G, BIOL 305, and CHEM 211 or CHEM 313.

**BIOL 475. Virology****3 Credits**

Mechanisms of viral infections of animals and man. BCHE 395 or BIOL 305 are recommended.

**Prerequisite(s):** BIOL 311 and MATH 121G.

**BIOL 476. Soil Microbiology****3 Credits**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation, and other environmental problems as influenced by soil microorganisms. SOIL 252 and BIOL 311 recommended. Same as SOIL 476.

**BIOL 476 L. Soil Microbiology Laboratory****1 Credit**

Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as SOIL 476L.

**Prerequisite(s)/Corequisite(s):** BIOL 476.

**BIOL 477. Applied and Environmental Microbiology****4 Credits**

A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology.

**Prerequisite(s):** MATH 121G, BIOL 311, and 311 L, or consent of instructor.

**BIOL 478. Molecular Biology of Microorganisms****3 Credits**

The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. BIOL 305 and BCHE 395 recommended.

**Prerequisite(s):** BIOL 311 and MATH 121G.

**BIOL 479. Medical Microbiology****3 Credits**

An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease.

**Prerequisite(s):** MATH 121G and BIOL 311 required, BIOL 474 recommended.

**BIOL 479 L. Medical Microbiology Laboratory****1 Credit**

Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** BIOL 479. Prerequisite(s): MATH 121G, BIOL 311, BIOL 311L.

**BIOL 480. Animal Behavior****3 Credits**

A survey of the field of animal behavior. BIOL 322 recommended.

**Prerequisite(s):** MATH 121G, BIOL 111G, and junior-level standing.

**BIOL 484. Animal Communication****3 Credits**

An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products.

**Prerequisite(s):** BIOL 111G or consent of instructor, and MATH 121G.

**BIOL 485. Comparative Stress Physiology****3 Credits**

This course explores the biochemical, hormonal, and molecular aspects of stress physiology in all organisms from bacteria to humans. Focus area include hormesis, temperature, radiation, oxygen, infection, and dehydration.

**Prerequisite(s):** MATH 121 and BIOL 211G.

**BIOL 488. Principles of Conservation Genetics****3 Credits**

Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations.

**Prerequisite(s):** MATH 121G and BIOL 305.

**BIOL 489. Genetic Aspects of Population Biology****3 Credits**

Basic theory of population genetics and how that theory has guided, and been influenced by, studies of natural populations.

**Prerequisite(s):** MATH 121G and BIOL 305 or equivalent.

**BIOL 490. Neurobiology****3 Credits**

Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems.

**Prerequisite(s):** BIOL 211, MATH 142G or equivalent.

**BIOL 498. Biology Research Programs****1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

**BIOL 503 L. Advanced Primate Adaptation and Evolution Laboratory****1 Credit**

Laboratory with exercises on non-human primate adaptation and evolution. Crosslisted with: ANTH 573 L.

**Corequisite(s):** BIOL 503.

**BIOL 510. Current Topics in Biology****3 Credits**

Introduction to diverse topics in modern biology, including dynamic areas of current research.

**BIOL 514. Plant Physiology****2 Credits**

Same as EPWS 514.

**Prerequisites:** BIOL 211G and CHEM 112G.

**BIOL 520. Molecular Cell Biology****3 Credits**

An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature.

**Prerequisite:** BIOL 377 or equivalent.

**BIOL 527. Symbiosis****3 Credits**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems.

**Prerequisite:** graduate status.

**BIOL 533. Environmental Physiology of Plants****3 Credits**

Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Same as AGRO 533 and HORT 533.

**Prerequisite:** BIOL 314 or consent of instructor.

**BIOL 534. Advanced Human Evolution****3 Credits**

Advanced overview of human biological evolution from the emergence of Miocene apes to the modern human diaspora. Crosslisted with: ANTH 534.

**Prerequisite(s):** ANTH 355 or consent of instructor.

**Corequisite(s):** ANTH 534L when offered.

**BIOL 536. Advanced Disease Vector Biology****3 Credits**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Taught with: BIOL 436.

**Prerequisite(s):** BIOL 211G and BIOL 305.

**BIOL 540. Science and Ethics****1-3 Credits (1-3)**

Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated up to 4 credits. Crosslisted with: PHIL 540.

**BIOL 541. Professional Development Seminar****1-3 Credits**

Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc.

**Prerequisite:** consent of instructor.

**BIOL 545. Molecular and Biochemical Genetics****3 Credits**

Same as BCHE 545.

**BIOL 550. Special Topics****1-3 Credits**

Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic entomology, or parasitism in animals. May be repeated for unlimited credit.

**Prerequisite:** consent of instructor, and designation of a specific topic before registration.

**BIOL 562. Advanced Genomics Technology****3 Credits**

This course covers current genomics techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. Consent of Instructor required.

**BIOL 566. Advanced Bioinformatics and NCBI Database****3 Credits**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study. Consent of Instructor required.

**BIOL 568. Communities and Ecosystems****3 Credits**

Community ecology is an interdisciplinary field that integrates numerous theories, concepts, and methods to study the patterns and dynamics of biotic assemblages. Because biotic groups affect the biogeophysical and biogeochemical processes that govern Earth system functioning, community ecology also plays an increasingly large role in the study of ecosystem ecology, a discipline which seeks to understand the processes governing nutrient and energy flow across the Earth system. This course will explore the theories and methods for study of biodiversity, biogeography, and community assembly, as well as the pathways through which communities exert influence on ecosystem functioning. Topics will also include evolutionary influences on communities, the integration of community ecology into conservation and land management, and community ecology in an era of rapid environmental change.

**BIOL 571. Advanced Molecular and Cellular Mycology****3 Credits**

Exploration of the world of fungi with emphasis on fungal molecular biology and development, including discussion of fungal taxonomy and genomics, using current literature. Consent of instructor required.

**BIOL 572. Advanced Primate Behavior and Ecology****3 Credits**

Advanced review of non-human primate social behavior and ecology. Crosslisted with: ANTH 572.

**BIOL 573. Fungal Biology****3 Credits (3+2P)**

Same as EPWS 572.

**Prerequisites:** EPWS 310 or BIOL 311, or consent of instructor.

**BIOL 574. Advanced Human Osteology****3 Credits**

Advanced human osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Crosslisted with: ANTH 574.

**Corequisite(s):** BIOL 574L when offered.

**BIOL 574 L. Human Osteology Laboratory****1 Credit**

Laboratory for BIOL 574. Experiences and activities related to identifying teeth and bones of the human skeleton. Crosslisted with: ANTH 574 L.

**Corequisite(s):** BIOL 574.

**BIOL 577. Advanced Topics in Environmental Microbiology****3 Credits**

This course is based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA and the human microbiome.

**Prerequisite(s):** Consent of instructor.

**BIOL 581. Physiology of Animals****3 Credits**

Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. BIOL 111G, BIOL 377 recommended.

**Prerequisite:** BIOL 211G.

**BIOL 582. Advanced Plant Signalling and Development****3 Credits**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 305 or GENE 315, and MATH 121G.

**BIOL 587. Behavioral and Evolutionary Ecology****3 Credits**

This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.

**BIOL 589. Speciation and Adaptation****3 Credits**

Examination of the two great themes of evolutionary biology. Begins with an historical overview of perspectives on these evolutionary processes, and then moves through the foundations of modern research to focus on recent advances driven by improvements in theory and technology. Emphasis on synthesis of the primary literature through lectures, discussion, and written assignments.

**BIOL 590. Neuroscience****1-3 Credits**

Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. May be repeated up to 9 credits.

**BIOL 598. Special Research Programs****1-9 Credits**

Individual investigations either analytical or experimental.

**BIOL 599. Master's Thesis****15 Credits**

Thesis.

**BIOL 600. Doctoral Research****1-15 Credits**

Research.

**BIOL 610. Seminar****1-3 Credits (1-3)**

Oral presentation and discussion of journal articles and ongoing research projects. May be repeated up to 6 credits. S/U Grading (S/U, Audit).

**BIOL 612. Microbiology Seminar****1 Credit**

Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.

**BIOL 697. University Teaching Experience****1-3 Credits**

Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

**BIOL 698. Selected Topics****1-3 Credits**

Selected topics for doctoral students.

**BIOL 700. Doctoral Dissertation****15 Credits**

Dissertation.

## **BLAW-BUSINESS LAW (BLAW)**

**BLAW 230. Business Law****3 Credits**

Introduction to law in general and application to business specifically; comprehensive study of the law of contracts; and the principal and agent relationship. Offered at all NMSU Community Colleges except Dona Ana Community College. Credit may not be earned in both BLAW 230 and BLAW 317.

**BLAW 313. Sports and the Law****3 Credits**

Introduction to legal concepts related to sports and business including an introduction to U. S. law and the civil practice, agency, sports contracts, sport torts, sport crimes, pertinent federal legislation such as Title IX, drugs and sports, international sports issues, pertinent antitrust issues, intellectual property, ethics and alternative dispute resolution.

**Prerequisite(s)/Corequisite(s):** BLAW 316.

**BLAW 316. Legal Environment of Business****3 Credits**

Survey of business law including: the legal system (court systems, sources and types of law, litigation and dispute resolution), ethics and corporate social responsibility, administrative law, tort law, contract law, agency and employment law, business structure and governance, securities regulations, and international law. Students may not receive credit for both BLAW 316 and BLAW 317.

**BLAW 325. Real Estate Principles and Law I****3 Credits**

Same as FIN 325.

**BLAW 330. Entrepreneurial Law****3 Credits**

This course will explore the legal issues faced in the process of launching, financing, and growing a new venture. We will pay special attention to ventures making use of innovative technologies and business models. Intellectual property (trade secrets and confidential information, patents, copyrights, and trademarks) are of special importance to innovation-driven ventures, so we will consider in-depth how intellectual property is developed, protected, and put to use.

**BLAW 385V. Consumers and the Law****3 Credits**

Study of the interrelationships between business, legal, and ethical aspects of consumer issues and their attendant civil liability and remedies in domestic and international markets.

**BLAW 418. Uniforms Commercial Code and Advanced Business Law****Topics****3 Credits**

Property, advanced contract law, debtor-creditor relations, bankruptcy and Uniform Commercial Code topics, including sales, negotiable instruments, secured transactions. Students who have taken BLAW 318 may not receive credit for BLAW 418.

**Prerequisite(s):** BLAW 316.

**BLAW 430V. American Indian Law and Policy****3 Credits**

Explores the principles, doctrines, and texts governing the legal relations between the United States and Indian tribes, the history of federal Indian law and policy, tribal property, treaty rights and sovereignty, congressional plenary power, the trust doctrine, jurisdiction in Indian country, and tribal government. Topic specifically examined in the course include tribal lawmaking powers, gaming and economic development in Indian country, protection of Indian religious rights and cultural property, water rights, fishing, hunting and other treaty-based rights.

**BLAW 490. Selected Topics****1-3 Credits**

Prerequisites vary according to the seminar being offered.

**BLAW 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head.

**Prerequisites:** junior or above standing and consent of instructor and department head.

**BLAW 502. Legal Environment of Business****3 Credits**

Legal procedures and the judicial system as applied to business situations and a general coverage of the bodies of substantive law most commonly associated with business.

**Prerequisite:** graduate students only.

**BLAW 518. Uniform Commercial Code and Advanced Business Law****Topics****3 Credits**

Property, advanced contract law, debtor-creditor relations, bankruptcy and Uniform Commercial Code topics, including sales, negotiable instruments, secured transactions. Students who have taken either BLAW 318 or BLAW 418 may not receive credit for BLAW 518. Same as BLAW 418 with differentiated assignments for graduate students.

**Prerequisite(s):** BLAW 316 or BLAW 502.

**BLAW 527. Negotiation and Business Dispute Resolution****3 Credits**

Focus on learning tactics related to conflict resolution skills and negotiation theory. Also the use of quantitative methods and their realistic application in resolving disputes. Students will participate in numerous role playing activities and simulated mediation games. Same as MGT 527.

**BLAW 530. American Indian Law and Policy****3 Credits**

This course is divided into two major parts: an historical survey of federal Indian law and policy, and selected topics focusing on contemporary federal Indian law and policy issues and problems. This course assumes that the students have not had any law courses and approaches the topic of the history of federal Indian law and policy from various multidisciplinary and interdisciplinary perspectives.

**BLAW 550. Selected Topics****3 Credits**

Seminars in selected topics related to business law or the legal environment of business.

**Prerequisite(s):** Varies according to seminar being offered.

**BLAW 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental with the prior consent of the instructor and department head.

**Prerequisite:** consent of instructor and department head.

## **BMGT-BUSINESS MANAGEMENT (BMGT)**

**BMGT 110. Introduction to Business****3 Credits**

Terminology and concepts of the business field. Role of accounting, computers, business management, finance, labor, and international business in our society. Restricted to: Community Colleges only.

**BMGT 112. Banks and Your Money****3 Credits**

Banking in today's economy: language and documents of banking, check processing, teller functions, deposit function, trust services, bank bookkeeping, loans, and investments. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**BMGT 126. Retail Management****3 Credits**

Phases of retailing, including types of retail outlets and basic problems of organizing and operating a retail store. Restricted to: Community Colleges only.

**BMGT 132. Principles of Selling****3 Credits**

Analysis of customer behavior, persuasive communication, process of the sales interview. Restricted to: Community Colleges only.

**BMGT 136. Fundamentals of Buying and Merchandising****3 Credits**

Covers operational aspects of procuring and selling merchandise for the retail store. Procedures covered are buying, receiving, pricing strategies, sales promotions and operational controls. Restricted to: Community Colleges only.

**BMGT 138. Advertising****3 Credits**

Psychological approach to non-personal consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures. Restricted to: Community Colleges only.

**BMGT 140. Principles of Supervision I****3 Credits**

Principles of supervision emphasizing planning, organization, rating of employees and procedures to develop good morale. Introduction to interpretation of case studies. Restricted to: Community Colleges only.

**BMGT 150. Income Taxation****3 Credits**

Federal income taxation of individuals, sole proprietorships, partnerships, corporations, trusts, and estates with particular reference to CLU, life insurance and annuities. Restricted to: Community Colleges only.

**BMGT 155. Special Topics I****1-3 Credits (1-3)**

Introductory special topics of lower division level work that provides a variety of timely subjects and content material. May be repeated up to 9 credits. Restricted to Community Colleges campuses only.

**BMGT 160. Self-Presentation and Etiquette****3 Credits**

Introduction to business etiquette based on tradition, social expectations, and professional behavior standards. Restricted to: Community Colleges only.

**BMGT 191. ENACTUS (Students in Free Enterprise)****1 Credit**

ENACTUS is an international organization promoting and teaching business entrepreneurship. Students learn teamwork, leadership, and networking skills by participating in regional and national business competitions and community service projects. May be repeated up to 6 credits. Restricted to: BMGT or Pre-Business majors. Restricted to Community Colleges only.

**BMGT 201. Work Readiness and Preparation****3 Credits**

Instruction in methods of selection, seeking, acquiring and retaining employment. Addresses work success skills, business etiquette, employer expectation and workplace norms. Restricted to Community Colleges campuses only.

**BMGT 205. Customer Service in Business****3 Credits**

Establishes concepts of service quality in relationship to business success and maximization of returns to the organization. Explores techniques for delivering quality and service in a variety of business settings. Restricted to: Community Colleges only.

**BMGT 208. Business Ethics****3 Credits**

The course examines the underlying dimensions of ethics in business, investigating ethics in relationship to the organization, the stakeholders, and society. Exploration of ethical issues from a historical context, analyzing actual events through the lens of business decision making, including legal/political, sociocultural, economic, and environmental considerations will be undertaken. Restricted to Community Colleges campuses only.

**BMGT 210. Marketing****3 Credits**

Survey of modern marketing concepts and practices focusing on the marketing mix: product, pricing, promotion, and distribution strategies. Topics include: the marketing environment, consumer behavior, marketing research, target marketing, and the ethical and social responsibilities of marketers. May be repeated up to 3 credits. Crosslisted with: MKTG 203. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BMGT 110 or BUSA 111.

**BMGT 212. Supervisory and Leadership Trends****3 Credits**

Current trends in marketing, merchandising, sales promotion and management; in manufacturing, merchandising and service types of businesses. Extensive use of practical student project. Restricted to Community Colleges only.

**Prerequisite(s):** BMGT 110 or BUSA 111.

**BMGT 213. Consumer Lending****3 Credits**

Principles of credit evaluation, types of credit, marketing, collections, legal aspects, installment lending, leasing management, insurance, and rate structure and yields. Restricted to: Community Colleges only.

**Prerequisite(s):** BMGT 112.

**BMGT 215. Banks and the Money Supply****3 Credits**

Practical application of the economics of money and banking. Required of all students electing the banking option. Restricted to: Community Colleges only.

**BMGT 216. Business Math****3 Credits**

Application of basic mathematical procedures to business situations, including percentage formula applications, markup, statement analysis, simple and compound interest, and annuities. Restricted to: Community Colleges only.

**Prerequisite(s):** CCDM 103 N or satisfactory math score on ACT.

**BMGT 221. Internship I****1-3 Credits (1-3)**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: BMGT majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**BMGT 225. Introduction to Commercial Lending****3 Credits**

Commercial lending overview, the lending process, portfolio management, and regulation and business development. Restricted to: Community Colleges only.

**Prerequisite(s):** BMGT 112.

**BMGT 231. Legal Issues in Business****3 Credits**

Survey of the legal environment of business and common legal principles including: the sources of law, dispute resolution and the U.S. court systems, administrative law, tort law, contract law, agency and employment law, business structure and governance, ethics and corporate social responsibility. Explores sources of liability and presents strategies to minimize legal risk. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**BMGT 232. Personal Finance****3 Credits**

Budgeting, saving, credit, installment buying, insurance, buying vs. renting a home, income tax statement preparation, investment, and estate disposal through will and trust. Restricted to: Community Colleges only.

**BMGT 235. Credit Administration****3 Credits**

Covers factors influencing and determining loan policy: methods of credit investigation and analysis, credit techniques, credit problems, and types of loans. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BMGT 112.

**BMGT 239. Visual Marketing Techniques****3 Credits**

Provides a basic understanding of visual marketing and merchandising techniques. The importance of effective presentation of a store and its merchandise is covered, as is line, balance and artistic display. Restricted to: Community Colleges only.

**BMGT 240. Human Relations****3 Credits**

Human interactions in business and industrial settings. Motivation and learning experiences as related to problems of the worker and supervisor. Practical applications of human behavior. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**BMGT 248. Introduction to Quality Management****3 Credits**

Introductory practices of total quality management practices aimed at all levels of an organization to continually improve performance to include competitiveness in today's business world. Restricted to: Community Colleges only.

**BMGT 250. Diversity in the Workplace****3 Credits**

Concepts of culture, diversity, prejudice, and discrimination within the domestic workforce/society. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BMGT 110 or BUSA 111.

**BMGT 260. Real Estate Practice****3 Credits**

This course is a requirement for licensure in real estate for the state of New Mexico. Topics covered include: real estate finance, settlement, foreclosure, federal taxation, valuation and appraisal, land descriptions and math skills. These topics are requirements of the New Mexico Real Estate Commission. Restricted to: Community Colleges only.

**BMGT 264. Real Estate Law****3 Credits**

This course is a requirement for licensure in real estate for the state of New Mexico. Topics covered include: ownership of real estate, real estate brokerage relationships, contracts, environmental concerns and federal laws that affect real estate. These topics are requirements of the New Mexico Real Estate Commission. Restricted to: Community Colleges only. Crosslisted with: PL S 264

**BMGT 268. Real Estate Broker's Basic Course****3 Credits**

State of New Mexico specific criteria that apply to real estate licensure: purchase agreements, listing agreements, New Mexico Rules and Regulations, and landlord tenant legislation. Restricted to: Community Colleges only.

**Prerequisite(s):** BMGT 260 & BMGT 264.

**BMGT 272. E-Commerce Operations****3 Credits**

Includes the many forms of e-commerce and emerging technologies that will impact the business of tomorrow. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 105 or CS 110 or BCIS 110.

**BMGT 275. Entrepreneur I****3 Credits**

Introduces students to the concept of entrepreneurship and the the process of business startups. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BMGT 110 or BUSA 111.

**BMGT 277. Small Business Management****3 Credits**

This course is designed to acquaint the student with the opportunities encountered in the management and operations of a small business enterprise. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BMGT 275.

**BMGT 280. Introduction to Human Resources****3 Credits**

Personnel functions encompassing job analysis, recruitment, selection, training, appraisals, discipline, and terminations. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BMGT 110 or BUSA 111 or B A 104.

**BMGT 282. Introduction to International Business Management****3 Credits**

Overview of the social, economic and cultural environment of international business transactions. Restricted to Community Colleges only.

**Prerequisite(s):** BMGT 110 or BUSA 111.

**BMGT 285. Introduction to Manufacturing Operations****3 Credits**

Introduction to issues related to manufacturing, including an overview of the production function, product design and development, location, layout, forecasting, planning, purchasing, materials/inventory, and quality management. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (BMGT 110 or BUSA 111) and (BMGT 140 or MGT 201).

**BMGT 286. Introduction to Logistics****3 Credits**

Overview on the planning, organizing, and controlling of transportation, inventory maintenance, order processing, purchasing, warehousing, materials, handling, packaging, customer service standards, and product scheduling. Restricted to: Community Colleges only.

**BMGT 287. Introduction to Export/Import****3 Credits**

Procedures and documentation for exporting and importing products. Emphasis on NAFTA regulations and other U.S. border operations crossings. Restricted to Community Colleges only.

**Prerequisite(s):** BMGT 110 or BUSA 111.

**BMGT 290. Applied Business Capstone****3 Credits**

Refines skills and validates courses taken in BMGT program. Business simulations, case studies and projects used to test and improve business practices. Student must be within 25 credits of graduation. May be repeated up to 3 credits. Restricted to: BMGT majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (BMGT 110 or BUSA 111), and (BMGT 140 or MGT 201), and (BMGT 240 or SOC 101 or PSY 201), and MKTG 203 and FIN 206.

**BMGT 298. Independent Study****3 Credits**

Individual studies directed by consenting faculty with prior approval of department chair. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Sophomore standing with 3.0 GPA.

## **BOT-BUSINESS OFFICE TECHNOLOGY (BOT)**

**BOT 101. Keyboarding Basics****3 Credits (2+2P)**

Covers correct fingering and mastery of the keyboard to develop skillful operation. Formatting basic business letters, memos, and manuscripts.

**BOT 102. Keyboarding: Document Formatting****3 Credits (2+2P)**

Designed to improve keyboarding speed and accuracy; introduce formats of letters, tables and reports. A speed and accuracy competency requirement must be met.

**Prerequisite:** BOT 101 or consent of instructor.

**BOT 105. Business English I****3 Credits**

Training and application of the fundamentals of basic grammar, capitalization and sentence structure (syntax).

**BOT 106. Business Mathematics****3 Credits (2+2P)**

Mathematical applications for business, including training in the touch method of the 10-key calculator.

**Prerequisite:** CCDM 103 N or adequate score on math placement exam.

**BOT 109. Business English II****3 Credits**

Training and application of the fundamentals of punctuation, numbers, basic writing and editing skills.

**Prerequisite:** C or better in BOT 105.

**BOT 110. Records Management****3 Credits**

Principles, methods and procedures for the selection, operation and control of manual and automated records systems.

**BOT 120. Accounting Procedures I****3 Credits (2+2P)**

Business accounting principles and procedures. Use of special journals, cash control, and merchandising concepts. Reports for sole proprietorships.

**BOT 121. Accounting Procedures II****3 Credits (2+2P)**

Continuation of BOT 120, emphasizing accounting principles and procedures for notes and interest, depreciation, partnerships and corporations, cash flow and financial statement analysis. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 120 or ACCT 221.

**BOT 135. Keyboarding Technique Review****3 Credits**

Emphasis on improving keyboarding speed and accuracy.

**Prerequisite:** BOT 101 or equivalent.

**BOT 140. Payroll Accounting****3 Credits (2+2P)**

Payroll procedures including payroll tax forms and deposits. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** ACCT 221 or BOT 120.

**BOT 150. Medical Terminology****3 Credits**

Understanding of the basic elements of medical words. Use of medical abbreviations. Same as NURS 150 and OEHO 120.

**BOT 169. Spanish Grammar for Business Administration****3 Credits**

Introductory course in Spanish grammar and practical business terms required for the proper application of fundamental oral and written business communication skills for Spanish speakers in the field of business administration. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Spanish-speaking ability and computer keyboarding ability.

**BOT 170. Office Communications in Spanish I****3 Credits**

Develop oral and written communications skills of native or near-native speakers of Spanish. The student will learn basic letter writing skills, customer service techniques, and telephone etiquette in Spanish. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 169, Spanish-speaking ability, and computer keyboarding ability.

**BOT 171. Office Communications in Spanish II****3 Credits**

Develop oral and written communications skills of native or near-native speakers of Spanish. Emphasis placed on learning the office assistant's role within the office environment. Compose complex business correspondence and learn to make international travel arrangements.

**Prerequisite:** BOT 101 or BOT 170.

**BOT 191. Taking Minutes & Proofreading****3 Credits**

Preparation and practice producing minutes suited for different meeting types and purposes. Provides strategies to prepare for meetings, to record proceedings, and to transcribe minutes while incorporating proofreading skills practice. Topics include legal requirements, meeting types, minute formats, and duties/expectations of the minute taker and the meeting chair. Graded: S/U. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 109 or consent of instructor.

**BOT 202. Keyboarding Document Production****3 Credits (2+2P)**

Further development of keyboarding speed and accuracy. Production of complex letters, memos, tables, reports and business forms. A speed and accuracy competency requirement must be met.

**Prerequisites:** BOT 102 and BOT 109, or consent of instructor.

**BOT 203. Office Equipment and Procedures I****3 Credits (2+2P)**

Office organization, telephone techniques, equipment and supplies, handling meetings, human relations, mail procedures, and travel.

**Prerequisites:** BOT 213 or C S 110G or consent of instructor.

**BOT 205. Microcomputer Accounting I****3 Credits (2+2P)**

Introduction to automated accounting systems on microcomputers.

**Prerequisite:** working knowledge of computers and accounting or consent of instructor.

**BOT 206. Microcomputer Accounting II****3 Credits (2+2P)**

Microcomputer accounting applications, integrating spreadsheets, word processing, graphics, and database. May be repeated up to 3 credits.

Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 121 or BOT 215.

**BOT 207. Machine Transcription****3 Credits (2+2P)**

Creating office documents using transcribing equipment and microcomputer software. Emphasis on proofreading, editing and grammar.

**Prerequisites:** minimum keyboarding of 45 wpm and C or better in BOT 105 or BOT 109 or equivalent and BOT 211 or BOT 213.

**BOT 208. Medical Office Procedures****3 Credits (2+2P)**

Current computerized and traditional administrative medical office procedures will be introduced. Practical knowledge on managing required record keeping in a medical office environment will be emphasized.

Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 109 or ENGL 111G, HIT 150 or AHS 120, and computer keyboarding ability or consent of instructor.

**BOT 209. Business and Technical Communications****3 Credits**

Effective written communication skills and techniques for career success in the work place. Composition of letters, memos, short reports, forms, and proposals, and technical descriptions and directions.

**Prerequisites:** ENGL 111G and computer keyboarding ability or consent of instructor.

**BOT 211. Information Processing I****3 Credits (2+2P)**

Defining and applying fundamental information processing concepts and techniques using the current version of leading software. Restricted to Community Colleges only.

**Prerequisite(s):** BOT 101 or consent of instructor.

**BOT 213. Word Processing I****3 Credits (2+2P)**

Operation and function of a word processor. Specific equipment to be announced in the Schedule of Classes.

**Prerequisite:** BOT 101 or keyboarding proficiency.

**BOT 214. Word Processing II****3 Credits (2+2P)**

Advanced operation and functions of a word processor. Specific equipment to be announced in the Schedule of Classes.

**Prerequisite:** BOT 213 or consent of instructor.

**BOT 215. Spreadsheet Applications****1-3 Credits**

Use of spreadsheets to include graphics and business applications. Same as OECS 215. May be repeated under different subtitles listed in the Schedule of Classes.

**BOT 217. Powerpoint Presentation****3 Credits**

Comprehensive, hands-on approach to learning and applying basic and advanced features of PowerPoint. These include text enhancements, objects, fills, colors, animation, charts, sound, video, and hyperlinks. Students demonstrate appropriate audience and communication tools to deliver presentations.

**Prerequisites:** BOT 211 or ability to demonstrate keyboarding and Windows proficiency.

**BOT 218. Information Processing II****3 Credits (2+2P)**

Advanced information processing techniques using current version of leading software. May be repeated for a maximum of 6 credits.

**Prerequisite:** BOT 211 or consent of instructor.

**BOT 220. Internship in Business Office Technology****2 Credits**

Experience in a supervised office position. Student must work at least eight hours per week. May be repeated for a maximum of 4 credits.

**Prerequisites:** sophomore standing and consent of instructor.

**BOT 221. Internship I****1-3 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: BOT & HIT majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**BOT 222. Internship II****1-3 Credits**

Continuation of BOT 221. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: BOT & HIT majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 221 and consent of instructor.

**BOT 223. Medical Transcription I****3 Credits (2+2P)**

Concepts in medical transcription are introduced on how to produce a variety of reports required in a medical office or facility utilizing accurate medical terminology, spelling, grammar, and document formatting. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HIT 150 or AHS 120 and HIT 158 and BOT 209.

**BOT 228. Medical Insurance Billing****3 Credits (2+2P)**

Comprehensive overview of the insurance concepts and applications required for successfully and accurately completing and submitting insurance claims and reimbursement processes for various insurance carriers, both private and government, will be emphasized. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HIT 150 or AHS 120 and BOT 208.

**BOT 233. Advanced Medical Transcription****3 Credits (2+2P)**

Builds upon the concepts introduced in Medical Transcription I providing greater understanding of how to produce advanced reports dictated by physicians with increasing speed and accuracy. Emphasis will be on proofreading and editing of operative reports, patient history and physicals, office notes, labor and delivery reports, consultation reports, discharge summaries, and other medical reports. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 223 and HIT 130.

**BOT 239. Personal Development****3 Credits**

Development of a marketable, employable office systems person, to include interview, voice, manners, and apparel.

**BOT 240. Introduction to Individual Taxation****3 Credits**

Overview of Individual Federal Taxation; awareness of tax problems pitfalls and planning opportunities; focus on individual personal financial concerns and tax planning. One semester of accounting principles/ procedures is recommended.

**BOT 241. Auditing and Business Issues****3 Credits**

Introduction to basic auditing concepts, the purpose for the auditing process, and requirements of persons assisting with the audit process. The course will also deal with issues of business law including contracts, sales, torts, strict liability, and business ethics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 120 or ACCT 221.

**BOT 244. Tax Preparation****3 Credits**

Introduces basic federal and state tax codes for preparing individual income tax returns. Emphasis on use of tax software.

**Prerequisite:** keyboarding proficiency.

**BOT 250. Electronic Office Systems****3 Credits (2+2P)**

Management of the electronic office. Office use of computers, printers, fax machines, copiers, and scanner concepts will be covered.

**Prerequisite:** BOT 211.

**BOT 255. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes.

**BOT 260. Bookkeeping Simulation Capstone****3 Credits (2+2P)**

Refines the professional and technical skills students have learned while completing the BOT-Bookkeeping Assistant Option curriculum by demonstrating how coursework ties together. Designed as a bookkeeping assistant capstone course.

**Prerequisite(s):** BOT 121 or ACCT 221, BOT 140, BOT 205, and BOT 244, or consent of instructor.

**BOT 270. Business Office Technology Capstone****3 Credits (2+2P)**

Refines professional skills learned in the BOT program and ties all BOT coursework together. Restricted to: Community Colleges only.

**Prerequisite(s):** BOT 102; and BOT 120; and BOT 209 or ENGL 203G or ENGL 218G; and BOT 211 or OECS 211.

## BUSA-BUSINESS ADMINISTRATION (BUSA)

**BUSA 111. Introduction to Business****3 Credits**

Fundamental concepts and terminology of business including areas such as management, marketing, accounting, economics, personnel, and finance; and the global environment in which they operate. May be repeated up to 3 credits.

## C D-COMMUNICATION DISORDERS (C D)

**C D 221. Introduction to Communication Disorders****3 Credits**

Basic information about speech, language, and hearing disorders; orientation to the professions of speech-language pathology and audiology.

**C D 301. Language Acquisition****3 Credits**

This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. May be repeated up to 3 credits. Crosslisted with: C D 509. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221; Cumulative GPA of 3.2 or higher.

**C D 322. Anatomy and Physiology of Speech Mechanisms****3 Credits**

Structure and function of systems underlying human speech sound production and processing, including respiratory, phonatory, and articulatory components. May be repeated up to 3 credits. Crosslisted with: C D 502. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, and C D 301; and minimum 3.2 GPA.

**C D 323. Phonetics****3 Credits**

The science of phonetics, including work with the International Phonetic Alphabet. Taught with C D 501. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221; Cumulative GPA of 3.2 or better.

**C D 324. Introduction to Speech Science****3 Credits**

Basic concepts and theories in acoustics, speech production and speech perception. Includes laboratory experience with instrumental measurement and analysis of speech systems. May be repeated up to 3 credits. Crosslisted with: C D 503. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422; and minimum 3.2 GPA.

**C D 325. Language Disorders****3 Credits**

Bases, symptoms, etiologies, and treatment of language disorders. Includes review of normal language acquisition. B or better in C D 301/ C D 509,C D 302/C D 593, C D 321, C D 322/C D 502, C D 323/C D 501, and minimum 3.0 GPA. Restricted to C D majors.

**Prerequisite(s):** C- or better in C D 221.

**C D 326. Clinical Methods and Procedures****3 Credits**

Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum. May be repeated up to 3 credits. Crosslisted with: C D 506. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, C D 301; and minimum 3.2 GPA.

**C D 374. American Sign Language I****3 Credits**

Introduction to the basics of ASL including questions, commands, sentence types, time, subjects and objects, classifiers, locative case, pluralization, and temporal and distributional aspects.

**C D 375. American Sign Language II****3 Credits**

Continuation of C D 374, ASL I. Emphasis on ASL grammar, spatial referencing, detailed descriptions, and deaf culture. Features dialogues, short stories, narratives.

**Prerequisite:** C D 374 or consent of instructor.

**C D 421. Speech and Language Disorders****3 Credits**

Bases, symptoms, etiologies, and clinical management of issues related to disorders of articulation, phonology, voice and resonance, and fluency. May be repeated up to 3 credits. Crosslisted with: C D 504. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, and C D 301; and minimum 3.2 GPA.

**C D 422. Audiology****3 Credits**

Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. May be repeated up to 3 credits. Crosslisted with: C D 507. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, and a minimum of 3.2 GPA.

**C D 423. Neural Bases of Communication Disorders****3 Credits**

Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. May be repeated up to 3 credits. Crosslisted with: C D 510. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 301, C D 323, C D 422, C D 324, C D 421, C D 322, C D 326 and minimum 3.0 GPA.

**C D 424. Aural Rehabilitation****3 Credits**

Overview of hearing aids and amplification devices including cochlear implants. Review of the bases and psychosocial aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLPs. May be repeated up to 3 credits. Crosslisted with: C D 508. Restricted to: C DS,C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, C D 301, C D 421, C D 322, C D 326; and minimum 3.2 GPA.

**C D 425. Professional Reasoning and Scientific Thinking****3 Credits**

Overview of constructive thinking, problem solving, and decision making theories and strategies associated with professional reasoning and scientific thinking that are to be used academically and clinically in the transition from student to scholar to professional. Taught with C D 593. May be repeated up to 3 credits. Restricted to: C DS, C D majors.

**Prerequisite(s):** B or better in C D 221, C D 323, C D 422, C D 324, C D 301, C D 421, C D 322, C D 326, and a minimum cumulative GPA of 3.2.

**C D 476. American Sign Language III****3 Credits**

Continuation of C D 375, ASL II. Focus on more complex grammatical features. Students will comprehend and generate medium length stories, narratives, and discussions including culturally significant topics.

**Prerequisite:** C D 375.

**C D 501. Phonetics****3 Credits**

The science of phonetics, including work with the International Phonetic Alphabet. Restricted to majors. Same as C D 390 with differentiated assignments for graduate students.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 502. Anatomy and Physiology of Speech Mechanisms****3 Credits**

Structure and function of systems underlying human speech sound production and processing including nervous, respiratory, and articulatory components. Restricted to majors. Same as C D 370 with differentiated assignments for graduate students.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 503. Speech Science****3 Credits (2+3P)**

Basic concepts and theories in acoustics, speech production, and speech perception. Laboratory experience with instrumental measurement and analysis of speech systems. Restricted to majors. Same as C D 380 with differentiated assignments for graduate students.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 504. Speech and Language Disorders****3 Credits**

Bases, symptoms, etiologies, and treatment of language disorders. Includes review of normal language acquisition. Taught C D 421.

**Prerequisite(s):** B or better GPA.

**C D 505. Research Methods****3 Credits**

Introduction to basic qualitative, quantitative, and single subject research methodology in speech-language pathology and audiology. Restricted to majors.

**Prerequisites:** a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 506. Clinical Methods and Procedures****3 Credits**

Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum. Differentiated assignments for graduate students. Taught with C D 326.

Restricted to: C DS, C D majors.

**Prerequisite(s):** B or better GPA.

**C D 507. Audiology****3 Credits**

Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. Differentiated assignments for graduate students. Taught with C D 422. Restricted to: C D, C DS majors.

**Prerequisite(s):** Minimum of 3.0 GPA.

**C D 508. Aural Rehabilitation****3 Credits**

Overview of hearing aids and amplification devices including cochlear implants. Review of the bases and psycho-social aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLPs. Taught with C D 424. Differentiated assignments for graduate students. Restricted to: C D, C DS majors.

**Prerequisite(s):** Minimum 3.0 GPA.

**C D 509. Language Acquisition****3 Credits**

Normal development of communication across the age span. Includes language sampling and analysis. A minimum grade of B- in all graduate courses and a minimum overall GPA of 3.0 required. Taught with C D 360 with differentiated assignments for graduate students. Restricted to CD majors and LING majors.

**C D 510. Neural Bases of Communication Disorders****3 Credits**

Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. Crosslisted with: C D 423. Restricted to: CD, CDS majors.

**C D 521. Professional Issues and Multicultural Practices in****Communication Disorders****3 Credits**

This course includes a range of topics pertinent to students entering professional practice as speech-language pathologists including current legal, cultural, ethical, and clinical service provision issues. Restricted to: C DS, C D majors.

**Prerequisite(s):** Minimum of 3.0 GPA.

**C D 522. Interpreter Workplace Skills in Communication Studies****1 Credit**

The purpose of this course is to identify principles and procedures necessary to be an effective interpreter and to use an interpreter in the field speech, language, hearing and swallowing disorders. Students will identify the history the use of interpreters, the interpreting process, bilingual vocabulary appropriate for the scope of practice in the field, bilingual assessment principles, second language learning principles and multicultural aspects to consider in the interview and interpreting process. The students will engage in several interpreter scenarios for interview, assessment and intervention cases. Restricted to: C D majors.

**Prerequisite(s):** Minimum of 3.0 GPA.

**C D 523. Assessment of Communication Disorders****3 Credits**

Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Restricted to: C DS, C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 525. Pediatric Language and Disorders****3 Credits**

Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** Minimum grade of B and an overall GPA of 3.0 or higher.

**C D 530. School Age Language and Disorders****3 Credits**

Normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** A minimum grade of B in all graduate courses and an overall GPA of 3.0 or higher.

**C D 535. Aphasia & Cognitive Linguistic Disorders****3 Credits**

Etiologies, diagnosis, assessment, and treatment of adult aphasia and cognitive-linguistic disorders. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 541. Advanced Spanish Morpho-Syntax for Education Professionals****3 Credits**

This class has been designed for Heritage Speakers of Spanish who work in educational settings. It will cover the essential linguistic theory and fundamental structures of the Spanish language. This includes, but is not limited to, verb morphology, morphosyntactic and syntactic structures.

The main goal of this course is to determine what usages fall within the norms of an individual's speech community, or if there are elements that fall outside those norms.

**Prerequisite(s):** Students have to be fluent in Spanish as course will be conducted in Spanish.

**C D 542. Articulation and Phonological Disorders****3 Credits**

Advanced study of the symptoms, etiologies, assessment, and clinical management of articulation and phonological disorders including cleft palate and disorders of resonance Restricted to: C DS,C D majors.

**Prerequisite(s):** A minimum grade of B- in all graduate courses and a minimum overall GPA of 3.0 is required.

**C D 545. Introduction to Augmentative and Alternatice Communication****3 Credits**

Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** Graduate standing; overall GPA of 3.0.

**C D 547. Cognitive-Linguistic Communication Disorders****3 Credits**

Topics include attention, memory, executive function, and underlying neuropathologies, with emphasis on assessment, diagnosis, prognosis, treatment and recovery processes in cognitive communication disorders related to traumatic brain injury, dementia, and right hemisphere brain damage. May be repeated up to 3 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0.

**C D 548. Best Practices in Bilingual/Multicultural Assessment for Practitioners****3 Credits**

The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests.

**Prerequisite(s):** C D 594.

**C D 555. Instrumentation in Communication Disorders****2 Credits**

This course will provide graduate students with information regarding the purpose and operation of a variety of perceptual assessment and instrumental tools for the evaluation and treatment of voice, fluency, and resonance disorders. Restricted to: C D majors.

**C D 574. American Sign Language III****3 Credits**

Continuation of ASL II. Focus on more complex grammatical features. Students will comprehend and generate medium length stories, narratives, and discussions including culturally significant topics.

**Prerequisite:** C D 375 or consent of instructor.

**C D 583. Dysphagia****3 Credits**

Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 584. Fluency Disorders****3 Credits**

Speech fluency development and the disorders of stuttering, cluttering, and neurogenic dysfluency. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 585. Motor Speech Disorders****3 Credits**

Advanced studies of dysfunction of the nervous system that affect speech. Includes evaluation, diagnosis, and treatment of speech apraxias and dysarthrias. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 586. Voice Disorders/Head and Neck Anomalies****3 Credits**

Advanced studies of anatomy and physiology of the vocal tract with emphasis on diagnosis, assessment, and treatment of voice disorders, laryngectomy, cleft palate, and other oral-facial anomalies. Restricted to: C DS,C D majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 587. Cleft Palate and Syndromes****2 Credits**

An advanced study of etiology, assessment and treatment of craniofacial anomalies with a focus on the effects of clefts of the lip and/or palate on speech, resonance and velopharyngeal dysfunction. Review of the contribution of interdisciplinary cleft palate team care managing feeding, audiologic, surgical, orthodontic, and psychosocial aspects. General review of embryology and common syndromes with associated speech, language, and hearing disorders. Consent of Instructor required. Restricted to: C D,C DS majors.

**Prerequisite(s):** A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 589. Practicum in Speech-Language Pathology****1-4 Credits (1-4)**

Supervised clinical practice in a variety of speech, language, and hearing disorders. Practicum includes diagnostic, treatment, and management work through direct patient/client contact. Attendance at weekly clinical staff meetings is required. May be repeated up to 15 credits. Restricted to: C DS,C D majors.

**Prerequisite(s):** Good standing in the graduate school; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 590. Clinical Education****1 Credit**

This course is specifically designed to target the knowledge base necessary to initiate clinical practicum in the CD Program. The learning objectives are based upon the Council of Academic Accreditation in Audiology and Speech-language Pathology (CAA) standards and knowledge areas. These learning outcomes are developed to assist students in clinical practicum and are specific to the services provided to clients of the NMSU Edgar R. Garrett Speech and Hearing Center. Restricted to: C DS,C D majors.

**Corequisite(s):** C D 589.

**C D 591. Special Topics****1-9 Credits**

Individual and/or group study of special topics identified by subtitle. May be repeated up to 9 credits. Restricted to: C DS majors.

**Prerequisite(s):** Prior arrangement with faculty; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

**C D 599. Master's Thesis****15 Credits**

Thesis.

**C D 640. Externship in Communication Disorders****3-9 Credits (3-9)**

This course is designed to provide opportunities for the developing clinician to provide treatment to and evaluations for clients in a full term externship experience under the supervision of a licensed SLP. May be repeated up to 9 credits. Consent of Instructor required. Restricted to: C DS,C D majors.

## C E-CIVIL ENGINEERING (C E)

**C E 109. Computer Drafting Fundamentals****3 Credits (2+2P)**

Same as DRFT 109, E T 109, SUR 109.

**C E 151. Introduction to Civil Engineering****3 Credits**

Problem solving and use of computer software for civil engineering applications. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Prerequisite(s): ENGR 100.

**C E 160. Geology for Engineers****4 Credits (3+3P)**

Basic concepts of geology, earth materials, and earth processes as they relate to engineering practice. Restricted to Las Cruces campus only.

**C E 198. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 233. Mechanics-Statics****3 Credits**

Engineering mechanics using vector methods. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 215G. Prerequisite(s): MATH 192G and cumulative GPA of 2.0.

**C E 234. Mechanics-Dynamics****3 Credits**

Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits. Crosslisted with: M E 234.

**Prerequisite(s):** C E 233, MATH 192G, PHYS 215G.

**C E 256. Environmental Engineering and Science****3 Credits**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: E S 256

**Prerequisite(s):** CHEM 111 and MATH 191G.

**C E 256 L. Environmental Science Laboratory****1 Credit**

Laboratory experiments associated with the material presented in C E 256. Same as E S 256L.

**Corequisite:** C E 256.

**C E 298. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 301. Mechanics of Materials****3 Credits**

Stress, strain, and elasticity of materials. May be repeated up to 3 credits.

**Prerequisite(s):** C E 233 or M E 236.

**C E 311. Civil Engineering Materials****3 Credits (2+3P)**

Introduction to the structure, physical properties, testing and mechanical behavior of civil engineering materials and components made from these materials.

**Prerequisite:** C E 301.

**C E 315. Structural Analysis****4 Credits (3+3P)**

Classical analysis of determinate and indeterminate structures; introduction to modern methods of structural analysis using computer programs.

**Prerequisite(s):** C E 301.

**C E 331. Fluid Mechanics and Hydraulics****3 Credits**

Fluid Mechanics and Hydraulics. Fundamentals and theory of fluid mechanics, compressible fluids, flow of incompressible fluids in open and closed conduits. Restricted to: CE majors.

**Prerequisite(s):** PHYS 215, C E 233.

**C E 331 L. Fluid Mechanics and Hydraulics Laboratory****1 Credit**

Fundamentals and Theory of Fluid Mechanic, compressible and incompressible flow of fluids in open and closed conduits.

**Prerequisite(s)/Corequisite(s):** C E 331. Restricted to: C E majors.

**C E 355V. Technology and the Global Environment****3 Credits**

A scientific basis for understanding changes in the global environment that result through the complex interactions of natural phenomena and the impacts of the activities of man.

**Prerequisites:** junior or senior standing, and the general education requirements for math and natural sciences.

**C E 356. Fundamentals of Environmental Engineering****3 Credits**

Introduction to water treatment and water pollution and the analysis and design of selected treatment processes.

**Prerequisite(s):** C E 256.

**C E 357. Soil Mechanics****3 Credits (2+3P)**

Engineering properties of soils, consolidation settlement, compaction, water flow through soils, geostatic stresses, soil shear strength, lateral earth pressure, and soil laboratory testing.

**Prerequisite(s):** C E 160 or GEOL 111G, and C E 301.

**C E 382. Hydraulic and Hydrologic Engineering****3 Credits**

Analysis and design of hydraulic systems, including pipe networks, open channels, regulating structures, and pumping systems. Surface water and groundwater hydrology, analysis and design. May be repeated up to 3 credits.

**Prerequisite(s):** C E 331 and C E 331 L.

**C E 398. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 430. Environmental Management Seminar II****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: CH E 430, E E 430, E S 430, E T 430, I E 430, M E 430 and WERC 430

**C E 444. Elements of Steel Design****3 Credits**

Analysis and design of tension members, beams, columns, and bolted and welded connections.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 445. Reinforced Concrete Design****3 Credits**

Design and mechanics of structural reinforced concrete members.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 452. Geohydrology****3-4 Credits (3+1P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: E S 452 and GEOL 452.

**Prerequisite(s):** Junior or Senior.

**C E 454. Wood Design****3 Credits**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 455, Masonry Design.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 455. Masonry Design****3 Credits**

Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454, Wood Design.

**Prerequisite(s)/Corequisite(s):** C E 311. Prerequisite(s): C E 315.

**C E 457. Foundation Design****3 Credits (2+3P)**

Application of principles of classical soil mechanics to the design of shallow and deep foundations, and the fundamentals of geotechnical site investigation.

**Prerequisite(s):** C E 357.

**C E 460. Site Investigation****3 Credits (2+2P)**

Investigation and characterization of surficial and subsurface geologic materials and ground water for civil engineering projects. Includes exploration program, drilling and sampling, rock and soil classification and logging, groundwater monitoring, profiles, and preparation of geotechnical reports. Pre/

**Prerequisite(s):** C E 357.

**Corequisite(s):** C E 457.

**C E 469. Structural Systems****3 Credits**

Design of structural systems for buildings and bridges. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C E 444 and C E 457 and C E 477.

Prerequisite(s): C E 445.

**C E 470. Design of Municipal and Hazardous Waste Landfills****3 Credits**

Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills.

**Prerequisite(s):** C E 357 and C E 452, or consent of instructor.

**C E 471. Transportation Engineering****3 Credits**

Highway and traffic design and systems.

**Prerequisite(s):** MATH 291.

**C E 473. Transportation Analysis****3 Credits**

Transportation Analysis of land-based transportation modes. Crosslisted with: C E 573.

**Prerequisite(s):** C E 471.

**C E 477. Engineering Economics and Construction Management****3 Credits**

Engineering economics, construction and project management. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** STAT 371, C E 357.

**C E 479. Pavement Analysis and Design****3 Credits**

Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, and rehabilitation concepts.

**Prerequisite(s):** C E 357.

**C E 481. Civil Engineering Capstone Design****3 Credits**

Culminating multidisciplinary project-oriented capstone design. Ethics, professional development, global issues.

**Prerequisite(s)/Corequisite(s):** C E 457, C E 471, C E 477. **Prerequisite(s):** C E 356, C E 382, and either C E 444 or C E 445.

**C E 482. Hydraulic Structures****3 Credits**

Engineering design of water-regulating structures. Capstone design course. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C E 477. **Prerequisite(s):** C E 382.

**C E 483. Surface Water Hydrology****3 Credits**

Hydrologic cycle and relationships between rainfall and surface water runoff.

**Prerequisite:** C E 331 or consent of instructor.

**C E 485. Design of Earth Dams****3 Credits**

Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors.

**Prerequisite(s):** C E 357.

**C E 498. Special Topics****1-3 Credits**

May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of department head.

**C E 501. Advanced Mechanics of Materials****3 Credits**

Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on elastic foundations, column theories, torsion, thick-wall cylinders. Same as M E 501.

**Prerequisites:** C E 301, MATH 392.

**C E 502. Advanced Mechanics of Steel Structures****3 Credits**

Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion.

**Prerequisite:** C E 444.

**C E 503. Special Design and Analysis Program****3-6 Credits**

Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. May be repeated once for a total of 6 credits.

**Prerequisite:** consent of instructor/committee.

**C E 504. Advanced Engineering Design****3 Credits**

Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled.

**Prerequisite:** consent of instructor/committee.

**C E 505. Advanced Mechanics of Concrete****3 Credits**

Advanced structural mechanics applicable to concrete structures. Topics include: nonlinear-inelastic modeling and analysis of reinforced concrete structures, seismic behavior of reinforced concrete structures, and deformation of members under various loads. To be taught along with C E 605.

**Prerequisite(s):** C E 445.

**C E 506. Advanced Soil Mechanics****3 Credits**

Stress and strain analyses in soil, stress paths; drained and undrained shear strengths of granular soils and clays, consolidation, liquefaction, soil improvement.

**Prerequisite:** C E 457 or consent of instructor.

**C E 507. Design of Earth Retaining Structures****3 Credits**

Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing. Pre/

**Prerequisite(s):** C E 357.

**Corequisite(s):** C E 457.

**C E 508. Advanced Soil Behavior****3 Credits**

The course covers particle-scale phenomena that govern the macro-scale behavior of soils. Topics covered in the class include classical concepts as well as contemporary advances in soil mechanics. The students will develop a fundamental understanding of soil-water interaction, theories of contact level deformation, and mass and energy transport through granular media. Consent of Instructor required.

**Prerequisite(s):** C E 357 or Instructor Consent.

**C E 509. Deep Foundations****3 Credits**

Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads.

**Prerequisite:** C E 457 or consent of instructor.

**C E 515. Finite Element Methods****3 Credits**

Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software.

**Prerequisite:** graduate standing or consent of instructor.

**C E 530. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research.

**C E 531. Open Channel Hydraulics****3 Credits**

Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation.

**Prerequisite:** C E 382 or consent of instructor.

**C E 543. Advances in Concrete Technology****3 Credits**

Advanced topics related to concrete materials, including mixture proportioning with nontraditional admixtures, roles and side effects of concrete admixtures, durability of concrete, nondestructive testing of concrete, creep, and shrinkage.

**Prerequisites:** C E 311 and C E 445.

**C E 544. Advanced Design of Steel Structures****3 Credits**

Connection design; beam, column, and beam-column stability and design; and seismic frame design.

**Prerequisites:** C E 444 and C E 468.

**C E 545. Advanced Concrete Design****3 Credits**

Prestressed concrete, ultimate strength theory, design of shell structures.

**Prerequisites:** C E 445 and C E 468.

**C E 547. Bridge Engineering****3 Credits**

Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation. May be repeated for a maximum of 6 credits.

**Prerequisite:** C E 469 or consent of instructor.

**C E 554. Wood Design****3 Credits**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design.

**C E 555. Masonry Design****3 Credits**

Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554 - Wood Design.

**C E 557. Water Resources Development****3 Credits**

Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details. Background: C E 450.

**Corequisite:** C E 483, or C E 482.

**C E 571. Structural Dynamics****3 Credits**

Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading.

**Prerequisite:** C E 468 or consent of instructor.

**C E 572. Earthquake Engineering****3 Credits**

Earthquake characteristics; seismic loads; elastic and inelastic response; analysis and design of buildings for earthquakes.

**Prerequisites:** graduate standing and consent of instructor.

**C E 573. Transportation Analysis****3 Credits**

Transportation analysis of land-based transportation modes. Crosslisted with: C E 473.

**Prerequisite(s):** C E 471.

**C E 577. Advanced Pavement Analysis****3 Credits**

Review of advanced constitutive models for pavement materials and their implementation in finite element analysis.

**Prerequisite(s):** C E 479 and C E 515 or consent of instructor.

**C E 579. Ground Improvement****3 Credits**

The objective of this course is to introduce common ground improvement techniques, including mechanical (compaction, soil reinforcement, preloading and accelerated consolidation) and chemical (cementing, ion-replacement, polymer bonding) stabilization methods, as well as seepage and dewatering. Emphasis will be placed on developing an understanding of the underlying physical and chemical processes involved in each case.

**Prerequisite(s):** C E 357.

**C E 581. Ground Water Hydrology****3 Credits**

Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality.

**Prerequisites:** MATH 392, G EN 452, and C E 382, or consent of instructor.

**C E 582. Statistical Hydrology****3 Credits**

Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. May be repeated up to 3 credits.

**C E 585. Slope Stability Analysis and Design****3 Credits**

Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.

**C E 586. Geotechnical Earthquake Engineering****3 Credits**

Earthquake origin and geology; wave propagation; dynamic soil properties; ground response analysis; local site effects; design ground motion; liquefaction assessment. Consent of Instructor required.

**Prerequisite(s):** C E 506 or consent of instructor.

**C E 596. Special Topics****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**C E 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester.

**C E 599. Master's Thesis****15 Credits**

Thesis.

**C E 600. Doctoral Research****1-15 Credits**

Research.

**C E 604. Advanced Engineering Topics****3 Credits**

In depth study of a topic at the forefront of environmental engineering & science. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally.

**C E 615. Advanced Finite Element Methods****3 Credits**

Finite element method with emphasis on stress analysis. May include development and use of plane stress, plane strain, and 3-D and shell elements. Includes static, dynamic, and nonlinear analysis.

**Prerequisite:** graduate standing.

**C E 645. Prestressed Concrete****3 Credits**

Behavior of prestressed concrete; design of statically determinate and indeterminate structures; estimation of prestress loss; flexure and shear strength; deflections and stress control; composite behavior and design.

**Prerequisites:** graduate standing and consent of instructor.

**C E 671. Scientific Approaches to Transportation Research****3 Credits**

This course addresses professional and ethical practices for doing, managing, and evaluating research programs and projects. Students will learn about the critical elements in the research process, turning research objectives into research hypotheses, testing of the hypotheses and evaluation of the results. The course will look at the scientific method as well as the management and handling of data as it applies to transportation research. Consent of Instructor required.

**Prerequisite(s):** C E 471.

**C E 682. Topics in Hydrodynamics II****3 Credits**

Selected topics in flow in open channels, flow through porous media, and transport of sediments and contaminants. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**C E 698. Special Research Programs****1-3 Credits**

May be subtitled. May be repeated for a maximum of 9 credits.

**C E 700. Doctoral Dissertation****15 Credits**

Dissertation.

## **C EP-COUNSELING & EDUC PSY (C EP)**

**C EP 110G. Human Growth and Behavior****3 Credits**

Introduction to the principles of human growth and development throughout the life span.

**C EP 199. Academic Excellence****1 Credit**

Academic curriculum of excellence that includes the development of collaborative learning and student success environment, learning diverse learning styles and multiple intelligences, and developing multi-contextual academic communication styles. Students must enroll in course for both Fall and Spring semesters. Course does not count toward CEP minor. May be repeated up to 2 credits.

**C EP 210. Educational Psychology****3 Credits**

Psychological foundations as they apply to the learner in the class room setting.

**C EP 215. The Preschool Child****3 Credits**

Survey of psychological development from conception to age five.

**C EP 240. Adolescence in School Settings****3 Credits**

Survey of psychological development during the adolescent years.

**C EP 298. Exploration of Counseling & Community Psychology****3 Credits**

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Course does not count towards CEP minor.

May be repeated up to 6 credits.

**C EP 298 H. Exploration of CCP****3 Credits**

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Taught with 298 with differentiated instruction and/or independent project to be determined. Restricted to Las Cruces campus only.

**C EP 299. Academic Excellence Classes****1-6 Credits (1-6)**

Academic curriculum of excellence that includes an in-depth understanding of the elements that promote student academic success. Students will develop leadership and presentation skills needed to forge effective student mentor relationships and conduct outreach to campus and local community leaders to cultivate a collaborative learning environment. May be repeated up to 6 credits.

**C EP 300V. Human Relations Training****3 Credits**

Gain skills, knowledge, and sensitivity for living and working with others.

**C EP 320. Sex Roles in Education****3 Credits**

Physiological, psychological, and political aspects of sex role socialization and the effects of these factors on personal development.

**C EP 420. Introduction of Mindfulness Practice****3 Credits**

Students will learn about contemplative practices through learning and participation in various mindfulness practices. Engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning.

**C EP 451V. Introduction to Counseling****3 Credits**

Principles of counseling for nonmajors.

**C EP 455. Addictions Prevention and Recovery****3 Credits**

Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. Taught with C EP 555.

**C EP 461. Family Guidance****3 Credits**

Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems. Taught with C EP 561.

**Prerequisite(s):** C EP 110G.

**C EP 495. Psychology, Multiculturalism and Counseling****3 Credits**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.

**C EP 495 H. Psych., Multiculturalism & Counseling****3 Credits**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psycho-social development, academic achievement and counseling. Taught with CEP 495. Differentiated instruction/independent project to be determined.

**C EP 498. Internship in Counseling & Community Psychology****1-6 Credits (1-6)**

Students will explore in more depth the fields of counseling, community, and school psychology professions by completing an internship. Through the completion of the internship students will gain hands on work experience, enhance sensitivity for respect with working with diverse populations, and hone their interpersonal skills needed to succeed in the counseling, community, and school psychology professions. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CCP majors.

**C EP 499. Independent Study****1-6 Credits**

Individual study directed by consenting faculty.

**C EP 503. Introduction to Counseling****3 Credits**

Overview of counseling theory, techniques, ethics, and professional issues. Same as C EP 451V. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, CEP, SPSY majors.

**C EP 505. Appraisal of Psychoeducational Achievement in a Diverse Society****3 Credits**

Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, SPSY, CEP majors.

**C EP 511. Introduction to Inferential Statistics****3 Credits**

An introduction to the theories and techniques of inferential statistics as applied to education and psychology. Includes sampling distributions, confidence intervals, t-test, correlation, and chi-square. Intended primarily for post-baccalaureate students. Both hand calculation and computer packages will be employed. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, SPSY, CEP, NURS, FCS majors.

**C EP 512. Human Development****3 Credits**

Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Non majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC, C G, CEP, SPSY majors.

**C EP 515. Learning Theory****3 Credits**

Survey and comparison of theory and research regarding human learning as they apply to development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Crosslisted with: C EP 615. Restricted to: C G, CMHC, CEP, SPSY majors.

**Prerequisite(s):** C EP 512 or consent of instructor.

**C EP 517. Multicultural Counseling****3 Credits**

Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C EP 512 or concurrent enrollment or consent of instructor. Restricted to: C G, CMHC, CEP, SPSY majors.

**C EP 519. Psychology of Social Identities****3 Credits**

Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Same as C EP 619. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CMHC, CEP, SPSY majors.

**Prerequisite(s):** C EP 512 or concurrent enrollment or consent of instructor.

**C EP 520. The Art & Science of Mindfulness****1-3 Credits (1-3)**

In this course students will learn about contemplative practices by learning about and participating in various mindfulness practices for self-care and to increase well-being. Students will learn about psychological theories and research that support the use of mindfulness in helping others increase their well-being. Students will learn how to teach mindfulness to others. Taught with CEP 490. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CEP, CMHC, SPSY, MSW, MPH, FCS majors.

**C EP 522. Organization and Administration of School Counseling****Services****3 Credits**

Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G, CEP, CMHC, SPSY majors.

**C EP 524. Professional Issues in Mental Health Counseling**  
**3 Credits**

History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: C G,CEPCMH,SPSY majors.

**C EP 529. Indigenous Counseling Theory and Practice**  
**3 Credits**

Students will explore current uses of indigenous modes and methods of counseling and therapy that are theoretically consonant with Indigenous/ Native traditions. They will examine the integration of such modes to ensure a progressive reconstruction of the counseling endeavor to include an indigenous epistemology in their work with clients. Taught with CEP 429. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: C G,CMHC,CEP,SPSY majors.

**C EP 532. Research Methods**  
**3 Credits**

Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,CEPCMH,SPSY majors.

**C EP 542. Appraisal Theory and Technique**  
**3 Credits**

Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC,CEPC G, SPSY, majors.  
**Prerequisite(s):** C EP 512 and C EP 517, or consent of instructor.

**C EP 547. Appraisal of Cognitive Functioning**  
**3 Credits**

Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Taught with CEP 647. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP,SPSY,CMHC,C G majors.  
**Prerequisite(s):** C EP 542 or consent of instructor.

**C EP 549. Indigenous Research Methods**  
**3 Credits**

Students will gain an understanding of ethical and respectful research practices from an Indigenous/culturally appropriate vantage. They will thoroughly examine the works of Native/Tribal and Indigenous scholarship. Additionally, safeguards for ethical research practices with native populations will be thoroughly examined with regard to intent, practice, and integration of outcome. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,CMHC,CEP,SPSY majors.

**C EP 550. Counseling Theory and Technique**  
**3 Credits**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 512, or concurrent enrollment.

**C EP 551. Diagnosis and Treatment Planning**  
**3 Credits**

Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 512 or concurrent enrollment or consent of instructor.

**C EP 552. Career/Life Planning and Vocational Assessment**  
**3 Credits**

Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: C G,CMHC,CEP,SPSY majors.

**Prerequisite(s):** Consent of instructor.

**C EP 554. Counseling Theory and Techniques for School Psychologists**  
**3 Credits**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CMHC,C G,CEP majors.

**C EP 556. Addictions Counseling**  
**3 Credits**

Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 550.

**C EP 558. Child and Adolescent Counseling Theory and Technique**  
**3 Credits**

Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 550 or consent of instructor.

**C EP 559. Healing Trauma, Including Historical and Intergenerational**  
**3 Credits**

Students will learn about Trauma to gain a deeper understanding of the socio-political implications of colonization on Native people groups. They will learn about incidents of physical and mental health disparities. Students will thoroughly examine the impact of the current mental health field on Native/Indigenous populations and engage the literature from Native Scholars to problem solve and create new ways to address the challenges that Native people and their communities face as members of mainstream Western society. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,CMHC,CEP,SPSY majors.

**C EP 562. Family Therapy Theory and Technique**  
**3 Credits**

Major theories of family therapy and associated assessment, intervention and evaluation techniques. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** C EP 550.

**C EP 563. Primary Care Psychology**  
**3 Credits**

Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: C G,SPSY,CMHC,MSW,CEP,MPH majors.

**C EP 566. Group Work Theory and Technique**  
**3 Credits**

Didactic and experiential learning in group theory and practice. Laboratory involves experiences in group participation and leadership. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 550, C EP 562 or consent of instructor.

**C EP 569. Indigenous Counseling Internship**  
**1-6 Credits (1-6)**

The primary purpose for this course is to provide students with the opportunity to study and practice under a well-known and recognized indigenous healing practitioner with the primary goal of affirming and activating the holistic paradigm of Indigenous knowledge into their work as practitioners in the helping professions to reveal the wealth and richness of Indigenous languages, worldviews, teachings and experiences. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: C G,CMHC,SPSY,CEP majors.

**C EP 572. Counseling Practicum**  
**1-6 Credits**

Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Crosslisted with: C EP 662. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 550 or consent of instructor.

**C EP 578. Advanced Counseling Practicum**  
**3-6 Credits**

Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of counseling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CMHC,CEP,SPSY,C G majors.

**Prerequisite(s):** C EP 572, C EP 566, or consent of instructor.

**C EP 579. Clinical Psychopharmacology**  
**3 Credits**

Basic biological aspects of psychopharmacology with applications to clinical populations and treatment implications. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP,CMHC,C G majors.

**Prerequisite(s):** Consent of instructor.

**C EP 580. Counseling Internship**  
**3-12 Credits**

Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Restricted to: C G,CEP,CMHC,SPSY majors.

**Prerequisite(s):** C EP 578.

**C EP 598. Special Research Programs****1-6 Credits**

Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 9 credits. Restricted to: C G,SPSY,CMHC,CEP majors.

**C EP 599. Master's Thesis****15 Credits**

Thesis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits. Restricted to: SPSY,CMHC,C G,CEP majors. Thesis/Dissertation Grading.

**C EP 607. Curriculum-Based Assessment and Intervention****3 Credits**

The study and practice of curriculum-based assessment and intervention for academic skills and problems among children and adolescents. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP majors.

**C EP 608. Diagnostic Class****3 Credits**

Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP,SPSY majors.

**C EP 612. Human Development****3 Credits**

Same as C EP 512 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP majors.

**C EP 615. Cognitive and Affective Bases Behavior****3 Credits**

This course provides an overview of cognitive and affective bases of behavior as well as the integration of cognition and affect in psychological processes. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Crosslisted with: C EP 515. Restricted to: C G,CMHC,SPSY, CEP majors.

**Prerequisite(s):** C EP 512.

**C EP 616. Spanish for Mental Health Professionals****3 Credits**

This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: SPSY,CEP majors.

**Prerequisite(s):** Enrolled in Bilingual School Psychology Training Grant with instructor consent.

**C EP 617. Psychology of Multiculturalism****3 Credits**

In this advanced course for post-master's graduate students in applied fields of psychology, students will apply psychological concepts related to multiculturalism as well as critical race theories, feminist theories, queer theories, and liberation theories to understand intersecting social identities. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

**C EP 618. Psychology of Poverty****3 Credits**

This course is designed to examine the nature, extent and impact of poverty on Southwestern populations and across the United States in relation to assessment and interventions and its impact on the education and psychological well-being of children and families. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

**C EP 619. Psychology of Social Identities****3 Credits**

Same as C EP 519 with differentiated assignments for Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY,CEP majors.

**C EP 622. Ethical/Professional Issues in Counseling Psychology****3 Credits**

History of counseling psychology, scientist-practitioner model, American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Focus on current ethical, professional, and scientific issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CEP majors.

**Prerequisite(s):** Consent of instructor.

**C EP 624. Ethics, Law & Professional Issues in School Psychology****3 Credits**

This course provides an introduction and overview of the profession of school psychology with emphasis on the roles, functions, and competencies of the school psychologist within the context of legal and ethical practice. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY majors.

**C EP 625. Legal and Ethical Issues in School Psychology****3 Credits**

Overview of legal/ethical, and professional standards in school psychology. NASP and APA codes of ethics, NM Mental Health and Children's codes, and child abuse/neglect laws. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 624.

**C EP 630. School Psychology Research and Program Evaluation****3 Credits**

Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**C EP 632. Counseling Psychology Research****3 Credits**

Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP major or consent of instructor.

**C EP 634. Introduction to Qualitative Research****3 Credits**

This course is intended to be an introduction to qualitative research methods for persons wishing to understand, apply, and conduct qualitative studies with human subjects in the fields of counseling and psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: SPSY, CEP majors.

**C EP 636. Advanced Statistics****3 Credits**

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. Both hand calculation and computer packages will be employed. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 511 or equivalent course work.

**C EP 637. Multivariate Statistics****3 Credits**

Theories and techniques of multivariate statistics as applied to education and psychology. Includes multiple regression, logistic regression, MANOVA, factor analysis, and structural equation modeling. Computer packages will be the primary tool for data analysis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 636 or equivalent course work.

**C EP 642. Psychometrics****3 Credits**

An introduction to psychometrics, including topics such as theory and techniques of psychological measurement, scale and inventory construction, reliability, validity, evaluation of measurement quality, classical and contemporary measurement theory, and standardization. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. Restricted to: SPSY, CEP majors.

**C EP 647. Appraisal of Cognitive Functioning****3 Credits**

Taught with C EP 547 with differentiated assignments for doctoral students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**C EP 648. Appraisal of Personality****3 Credits**

Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**C EP 649. Behavioral Assessment & Intervention****3 Credits**

The course introduces basic concepts, methods, and applications of behavioral assessment and intervention. Students will learn how to conduct functional assessments of behavior and how to write behavior intervention plans. Methods appropriate for assessment and intervention of school-age children will be emphasized. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**C EP 651. Diagnosis and Treatment Planning****3 Credits**

Same as C EP 551 with differentiated assignments for Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**Prerequisite(s):** C EP 612 or consent of instructor.

**C EP 652. Career/Life Planning and Vocational Assessment****3 Credits**

Same as C EP 552 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**C EP 658. Child and Adolescent Counseling Theory and Technique****3 Credits**

Same as C EP 558 with differentiated assignments for Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 554 or C EP 673.

**C EP 662. Family Therapy Theory and Technique****3 Credits**

Taught with C EP 562 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Crosslisted with: C EP 572. Restricted to: SPSY, CEP majors.

**Prerequisite(s):** C EP 554 or C EP 673.

**C EP 670. Behavioral Health Practicum****1-6 Credits**

An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: MSW, CEP, SPSY majors. S/U Grading (S/U, Audit).

**C EP 671. Consultation****3 Credits**

Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP, SPSY majors.

**Prerequisite(s):** C EP 647, C EP 505, or consent of instructor.

**C EP 672. Practicum in School Psychology: Psychoeducational****1-6 Credits**

Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Graded: S/U. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP, SPSY majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 647, C EP 505.

**C EP 673. Counseling Psychology Theory/Practicum****1-6 Credits**

Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP majors.

**Prerequisite(s):** Consent of instructor.

**C EP 675. Practicum in School Psychology: Psychological****1-6 Credits**

School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multifactor, integrative, family assessments) expected of school psychologists. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: SPSY, CEP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 672 or consent of instructor.

**C EP 676. Field Experience in Educational Diagnostics****1-6 Credits (1-6)**

C EP 676 is designed to provide students with supervised school-based experiences and practices. The goal of the course is for students to master the competencies required for the delivery of academic services in the educational diagnostician role. The specific emphases in this course are placed on a data-based decision-making skills, psychoeducational assessment activities, and academic interventions. Under faculty and school-system staff supervisions, students will assume service delivery responsibilities and with increasing independence will respond to the diagnostic and intervention needs of students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP, SPSY majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 647, C EP 608, C EP 505, C EP 672.

**C EP 677. Group Work Theory/Practicum****1-6 Credits**

Application of theory in group work with clients and in supervising group leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CEP, SPSY majors.

**Prerequisite(s):** C EP 673.

**C EP 678. Advanced Counseling Psychology Practicum****1-6 Credits**

Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Graded: S/U. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Restricted to: CEP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 677.

**C EP 679. Supervision Theory and Practicum****1-6 Credits**

Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. May be repeated for a maximum of 6 credits. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits. Restricted to: CEP majors.

**Prerequisite(s):** C EP 675 or C EP 678; and consent of instructor.

**C EP 680. Internship in Counseling Psychology I****1-18 Credits**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. May be repeated for a maximum of 18 credits. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits. Restricted to: CEP majors.

**C EP 681. Advanced Multicultural School Psychology Field Experience****3 Credits**

Supervised school psychology field experience including appraisal diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation from a multicultural perspective with diverse populations. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. Restricted to: SPSY, CEP, C EP majors.

**Prerequisite(s):** C EP 672, C EP 675.

**C EP 682. Internship in Counseling Psychology II****1-18 Credits**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits. Restricted to: CEP majors.

**Prerequisite(s):** Consent of instructor.

**C EP 684. Internship in School Psychology****1-12 Credits (1-12)**

Supervised experience in school psychology. May be repeated for a maximum of 12 credits. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Restricted to: SPSY majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 672, C EP 675.

**C EP 685. Doctoral Internship in School Psychology****6-12 Credits (6-12)**

Supervised doctoral internship experience in school psychology. 1800 to 2000 clock hours are completed on a full-time basis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: SPSY, C EP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** C EP 672, C EP 675, C EP 681.

**C EP 693. Dissertation Seminar****3 Credits**

Same as ELA, EDUC, SPED 693. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CEP majors.

**C EP 698. Selected Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits. Restricted to: CEP majors.

**C EP 699. Ed.S. Thesis****1-15 Credits**

Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits. Restricted to: CEP majors. Thesis/Dissertation Grading.

**C EP 700. Doctoral Dissertation****15 Credits**

Dissertation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits. Restricted to: CEP, C EP majors. Thesis/Dissertation Grading.

## C J-CRIMINAL JUSTICE (C J)

**C J 101G. Introduction to Criminal Justice****3 Credits**

Examination of crime and justice within the broader social and cultural context of U.S. society from interdisciplinary social science perspectives. Includes critical analysis of criminal justice processes and the ethical, legal, and political factors affecting the exercise of discretion by criminal justice professionals.

**C J 199. Special Topics in Criminal Justice I****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated under different topics for a maximum of 6 credits.

**C J 205. Criminal Law****3 Credits**

Rules, principles, and doctrines of criminal liability in the United States. The historical development, limits, and functions of the substantive criminal law. May be repeated up to 3 credits.

**C J 210. The American Law Enforcement System****3 Credits**

Historical and philosophical foundations of law and order. An in-depth examination of the various local, state, and federal law enforcement agencies.

**C J 221. Fundamentals of Criminal Investigation****3 Credits**

Investigation procedures from crime scene searches, collection of evidence, and case preparation. Community Colleges only. (Note: students completing C J 221 may not take C J 321.)

**C J 230. Introduction to Corrections****3 Credits**

Development of correctional philosophy, theory, and practice. Instructional and non-institutional alternatives available in the corrections process.

**C J 250. Courts and the Criminal Justice System****3 Credits**

Structures and functions of American courts. Roles of attorneys, judges, and other court personnel; operation of petit and grand juries, trial and appellate courts.

**C J 293. Field Experience in Criminal Justice****3-6 Credits**

Field experience in a public criminal justice agency or equivalent private sector organization. Supervised internship experience, conferences, and observations. Restricted to majors. Community Colleges only.

**Prerequisites:** C J 101G, prior arrangement and consent of instructor and a GPA of 2.0 or better in major.

**C J 300. Introduction to Criminal Justice Research****3 Credits**

Overview and evaluation of criminal justice research. Selection of research topics, methods of data selection and collection, analysis techniques, and presentation of findings.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 301. Advanced Research Methods****3 Credits**

Study of selected quantitative and qualitative skills and their application to criminal justice research.

**Prerequisite:** Restricted to majors or consent of instructor.

**C J 302. Crime, Justice and Society****3 Credits**

Through critical analysis students build a rich understanding of the role of crime in our contemporary landscape and explore ideas and practices associated with justice, victimization, criminality, morality and righteousness. The course cultivates knowledge & awareness of the interactions between socially constructed phenomena (race, class, power, ethnicity, economic structures) and popular beliefs, policies, and practices associated with crime, punishment, and formal social control. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 111G, 203G, 211G, 218G, & 311G. Restricted to: Criminal Justice majors.

**C J 303. Introduction to Criminological Theory****3 Credits**

Defining and measuring crime, crime causation, and the criminal behavior system, and their linkage to criminal justice policies, procedures, and practices. Completed two of the following: ENGL 111G, 203G, 211G, 218G, or 311G. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors or consent of the instructor and must have completed C J 300.

**Corequisite(s):** Must be enrolled or have completed third English writing class.

**C J 304. Historical Perspectives of Criminal Justice Systems****3 Credits**

Examines the precursors to and development of three distinct systems associated with crime and punishment in the United States: the Courts, the Police, & Corrections. By studying the historical context and socio-political backdrop in which these institutions emerged and expanded students will come to a richer understanding of them and their attendant policies, practices, conventions, and assumptions. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 111G, 203G, 211G, 218G, & 311G. Restricted to: Criminal Justice majors.

**Prerequisite(s):** C J 300.

**C J 306. Criminal Procedural Law****3 Credits**

Legal analyses of the rights of criminal defendants; legal duties and responsibilities of criminal justice personnel in the processing of criminal defendants. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 307. Law of Evidence****3 Credits**

Evidentiary rules and concepts and their application in a criminal trial. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 321. Criminal Investigation and Intelligence****3 Credits**

Principles of criminal investigation and intelligence production; processing cases from complaint through crime scene search, identification and collection of evidence, interviewing and interrogation, and case preparation for courts. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 331. American Correctional Institutions****3 Credits**

Structure, organization, and operations of United States jails and prisons. Overview of correctional standards and classification systems, emphasizing current theory and practice.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 332. Correctional Law****3 Credits**

Federal and state laws and rules of post-conviction procedures; rights of the convicted related to sentencing, appeals, clemency, and restoration of rights.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 333. Juvenile Corrections****3 Credits**

Development and implementation of juvenile facilities and community programs. Effectiveness of current corrections practices. Restricted to majors.

**C J 345. Victimology****3 Credits**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 346. Psychology and the Justice System****3 Credits**

Analysis of psychological underpinnings of criminal behavior and the implications of these psychological principles for criminal justice policy. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** Restricted to majors, Forensic Science minors, or consent of instructor.

**C J 347. Sex Crimes****3 Credits**

Dynamics of sex crimes for victims and offenders, plus consideration of the legal and correction systems' response to sex crimes. Restricted to majors.

**C J 348. Serial Killers****3 Credits**

Overview and critical assessment of serial homicide and its relevance for contemporary U.S. society. Focus on factors influencing definitions and cultural understanding of serial homicide.

**Prerequisite(s):** 60 credit hours.

**C J 360. The Juvenile Justice System****3 Credits**

History, development, and philosophy behind a separate juvenile justice system. Role of the juvenile court, evaluation of juvenile law and procedure, and the processing of juvenile offenders.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 380. Introduction to Terrorism****3 Credits**

Overview of the phenomenon of terrorism, psychological and sociological theories of terrorism, and various contemporary governmental policies.

**C J 391. Special Readings in Criminal Justice****1-3 Credits**

Individually chosen subject areas not readily available in other courses. May be repeated for a maximum of 6 credits under different subtitles. Restricted to majors.

**Prerequisites:** at least a 2.5 GPA and consent of instructor.

**C J 393. Internship in Criminal Justice****1-12 Credits**

Field experience in a local, state, or federal criminal justice or private security agency. Includes orientation, observation, conferences, and work experience. Credits limited to six if student has taken C J 293. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.

**Prerequisites:** consent of instructor and GPA of 2.5 or better.

**C J 399. New Mexico Law****3 Credits**

Same as GOVT 399, JOUR 399, SOC 399, and HIST 399.

**C J 405. Juvenile Courts and Law****3 Credits**

History, development, and current status of juvenile courts. Legal status of juveniles in court and constitutional protections afforded them. Restricted to majors.

**C J 410. Criminal Justice Administrative Systems****3 Credits**

Administrative structures in criminal justice agencies and institutions; relationship of administrative structures to practical police, courts, and corrections problems.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 412. Introduction to Security Technology and Loss Prevention****3 Credits**

Private and public responses to security problems, including employee theft, perimeter security, and domestic or foreign terrorism; reviews related law and management practices.

**C J 414. Race, Crime and Justice****3 Credits**

Historical and contemporary analysis of the relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

**C J 416. Global Perspectives on Youth and Drug Use****3 Credits**

Overview of global drug use among young people, comparative legal structures, formal and informal responses. Restricted to C J, ANTH, GOVT, SOC, W S, S WK majors.

**C J 417. Drugs In Our World****3 Credits**

Comparative analysis of patterns and theories of drug use, formal government mitigation strategies.

**C J 424. Forensic Law****3 Credits**

Overview of the rules and issues related to the use of scientific information in the legal process. May be repeated up to 3 credits. Restricted to: C J majors.

**Prerequisite(s):** C J major, Forensic Science minors, or consent of instructor.

**C J 425. Issues in Ethics, Law, and Criminal Justice****3 Credits**

Examination of the key ethical and decision-making dilemmas facing professionals working in the field of law and criminal justice.

**Prerequisite:** restricted to majors or consent of instructor.

**C J 427. Race and Crime in Film****3 Credits**

Critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

**Prerequisite(s):** 60 credit hours.

**C J 428. Mexican-American and Issues of Social Justice****3 Credits**

In this course we will explore and discuss social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."

**Prerequisite(s):** Students must have completed C J 300 or research methods equivalent or consent from the instructor.

**C J 429. Immigration & Justice****3 Credits**

This course is designed to introduce undergraduate students to the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

**Prerequisite(s):** Student must have completed C J 300 or Research Methods equivalent or consent of the instructor.

**C J 430. The U.S. Supreme Court and the Criminal Justice System**  
**3 Credits**

History and workings of the U.S. Supreme Court in the context of the criminal justice system from writs of certiorari to last minute appeals in death penalty cases, including study of specific U.S. Supreme Court cases in the areas of criminal law, criminal procedural law, 8th amendment prison sentencing issues, and death penalty cases. Consent of Instructor required. Restricted to: Criminal Justice majors.

**C J 431. Family Violence and the Law**  
**3 Credits**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

**C J 432. Issues in Criminal Justice**  
**3 Credits**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated for unlimited credits under different subtitles.

**C J 434. Probation, Parole, and Community Corrections**  
**3 Credits**

Structure, organization, and operation of probation, parole, and other community-based correctional programs in the U.S. Overview of historical and recent trends in the supervision of offenders in the community and in the development of alternatives to incarceration. Analysis of issues related to community correctional policies and practices. Restricted to majors.

**C J 435. Political Penology**  
**3 Credits**

Comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

**C J 436. Courts and Sentencing**  
**3 Credits**

This course will focus on the structure, organization, and operation of the state and federal court systems in the United States. It examines courtroom decision making and dynamics of courthouse justice—prosecutorial discretion, plea bargaining practices, jury and judicial decision making and sentencing. Additional topics will include racial, gender and class disparities in sentencing outcomes and the impact of recent reforms directed at the criminal court system. Restricted to: Criminal Justice majors.

**C J 437. Wrongful Convictions**  
**3 Credits**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

**C J 440V. Comparative Criminal Justice Systems**  
**3 Credits**

Cross-national study of selected Western and non-Western legal systems. Comparison of structures and functions of police, court systems, and corrections in different systems.

**C J 449. Senior Seminar**  
**3 Credits**

Problems and conflicts encountered in major attempts to control crime. Restricted to majors.

**Prerequisite(s):** C J 101, C J 205, C J 210, C J 230, C J 250, C J 300, C J 301, 90 credit hours completed.

**C J 451. Border Violence and Justice**  
**3 Credits**

Critical analysis of violence and systems of justice along border regions. Examines causes and correlates of violence experienced by those living in border regions and the social responses to that violence.

**C J 453. Women and Justice**  
**3 Credits**

Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors.

**C J 454. Human Trafficking**  
**3 Credits**

Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, W S, S WK majors.

**C J 455. Feminist Research Methods**  
**3 Credits**

Feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as W S 455.

**C J 484. Hate Crimes & Groups**  
**3 Credits**

Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups, and social theories attempting to explain violent hate.

**C J 501. Research Methods in Criminal Justice**  
**3 Credits**

Research design, methods of data collection and analysis, and preparation of research reports. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 511. Nature of Crime**  
**3 Credits**

Defining and measuring crime, crime causation, and criminal behavior systems. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 514. Advanced Race, Crime, and Justice**  
**3 Credits**

Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

**C J 515. A Course on Punishment**  
**3 Credits**

Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system.

**C J 520. Advanced Girls, Women & Crime**  
**3 Credits**

Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, W S majors. Crosslisted with: W S 520

**C J 521. Law and Social Control****3 Credits**

The development and implementation of criminal law. Consideration of functionalist, conflict, and interpretive theories and research. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 524. Forensic Law****3 Credits**

Rules and policy implications related to the use of scientific information in legal process. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 525. Issues in Ethics, Law, and Criminal Justice****3 Credits**

Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors.

**C J 527. Advanced Race & Crime in Film****3 Credits**

Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

**C J 529. Advanced Immigration & Justice****3 Credits**

Advanced analysis of the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

**C J 530. Advanced U.S. Supreme Court and the Criminal Justice System****3 Credits**

Advanced history and workings of the U.S. Supreme Court in the context of the criminal justice system from writs of certiorari to last minute appeals in death penalty cases, including study of specific U.S. Supreme Court cases in the areas of criminal law, criminal procedural law, 8th amendment prison sentencing issues, and death penalty cases. Restricted to: Criminal Justice majors.

**C J 531. Advanced Family Violence and the Law****3 Credits**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

**C J 532. Advanced Issues in Criminal Justice (f, s, sum)****3 Credits**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit.

**C J 535. Advanced Political Penology****3 Credits**

Advanced comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

**C J 537. Advanced Wrongful Convictions****3 Credits**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

**C J 541. Seminar in Criminal Justice Policy Analysis and Planning****3 Credits**

Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and outcomes. Topics announced in the Schedule of Classes. Restricted to majors.

**Prerequisite:** C J major or consent of instructor.

**C J 545. Advanced Victimology****3 Credits**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes. Same as W S 545.

**C J 554. Advanced Human Trafficking****3 Credits**

Advanced study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, W S, S WK majors.

**C J 555. Advanced Feminist Research Methods****3 Credits**

Advanced feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as W S 555.

**C J 560. Juvenile Justice Systems****3 Credits**

Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. CJ 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.

**C J 581. Community Policing****3 Credits**

Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.

**C J 591. Directed Readings in Criminal Justice****3 Credits**

Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.

**C J 592. Independent Research****1-3 Credits**

Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.

**C J 593. Internship****3-6 Credits**

Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite(s):** introductory graduate course in the area of the internship and consent of the internship supervisor.

**C J 599. Master's Thesis****15 Credits**

Thesis.

## C S-COMPUTER SCIENCE (C S)

**C S 110. Computer Literacy****3 Credits**

This course provides a broad introduction to computing, including computer and information technology concepts; economic and social implications of technology; database management, spreadsheet, word processing, and presentation applications.

**C S 111. Computer Science Principles****4 Credits (3+2P)**

This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future.

**Prerequisite(s):** MATH 120 or higher.

**C S 117. Introduction to Computer Animation****3 Credits**

Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

**C S 150. C Programming****3 Credits (2+2P)**

Programming in the C language. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 120 or higher.

**C S 151. C++ Programming****3 Credits (2+2P)**

Introduction to object-oriented programming in the C++ language. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 120 or higher.

**C S 152. Java Programming****3 Credits (2+2P)**

Programming in the Java language. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 120 or higher.

**C S 153. Python Programming I****3 Credits**

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required.

**Prerequisite(s):** MATH 120 or higher.

**C S 154. Python Programming II****3 Credits**

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

**Prerequisite(s):** C S 153 or C S 453.

**C S 155. Internet Programming I****3 Credits**

This course is an introduction to programming for the Web in PHP and Javascript, covering fundamental web scripting ideas, CSS, data types and variables, functions, simple object creation and usage. Javascript usage will focus on dynamic page content. No prior programming experience is required, though a basic understanding of HTML will be assumed.

**Prerequisite(s):** MATH 120 and a basic understanding of HTML.

**C S 156. Internet Programming II****3 Credits**

This course covers advanced web scripting, including Javascript with AJAX, PHP integration with databases, object oriented features of PHP and Javascript, advanced CSS usage, and using web application frameworks.

**Prerequisite(s):** C S 155 or C S 455.

**C S 157. Topics in Software Programming and Applications****3 Credits (2+2P)**

Current topics in computer programming and software applications.

Topic announced in the Schedule of Classes. May be repeated if subtitle is different.

**C S 158. R Programming I****3 Credits**

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.

**Prerequisite(s):** MATH 121G.

**C S 159. R Programming II****3 Credits**

This course covers advanced R programming, including advanced data collection processing, advanced data visualizations, object oriented features of R, and file processing. It is recommended that students have one statistics course before taking this course.

**Prerequisite(s):** C S 158 or C S 458.

**C S 171G. Introduction to Computer Science****4 Credits (3+2P)**

Computers are now used widely in all area of modern life. This course provides understanding of the theoretical and practical foundations for how computers work, and provides practical application and programming experience in using computers to solve problems efficiently and effectively. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Weekly labs stress using computers to investigate and report on data-intensive scientific problems. Practical experience in major software applications includes an introduction to programming, word processing, spreadsheets, databases, presentations, and Internet applications.

**Prerequisite(s):** MATH 210G or MATH 120 or higher.

**C S 172. Computer Science I****4 Credits (3+2P)**

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. Crosslisted with: C S 460.

**Prerequisite(s):** MATH 121G or higher; C S 111 or successful placement.

**C S 209. Special Topics.****1-3 Credits**

May be repeated for a maximum of 12 credits.

**C S 271. Object Oriented Programming****4 Credits (3+2P)**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Pointers and dynamic memory allocation. Hands-on experience with useful development tools. May be repeated up to 4 credits.

**Prerequisite(s):** C- or better in C S 172 or E E 112.

**C S 272. Introduction to Data Structures****4 Credits (3+2P)**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms.

**Prerequisite(s):** At least a C- in C S 172, or placement.

**C S 273. Machine Programming and Organization****4 Credits (3+2P)**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages.

**Prerequisite(s):** At least a C- in C S 172 or E E 161.

**C S 278. Discrete Mathematics for Computer Science****4 Credits (3+2P)**

Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. Crosslisted with: MATH 278.

**Prerequisite(s):** At least C- in C S 172.

**C S 343. Algorithm Design & Implementation****3 Credits**

Introduction to efficient data structure and algorithm design. Basic graph algorithms. Balanced search trees. Classic algorithm design paradigms: divide-and-conquer, greedy scheme, and dynamic programming.

**Prerequisite(s):** At least a C- in C S 272, or consent of instructor.

**C S 370. Compilers and Automata Theory****4 Credits (3+2P)**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components.

**Prerequisite(s):** At least a C- in C S 271, C S 272, C S 273, and C S 278.

**C S 371. Software Development****4 Credits (3+2P)**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project.

**Prerequisite(s):** At least a C- in C S 271 and C S 272.

**C S 372. Data Structures and Algorithms****4 Credits (3+2P)**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and red-black trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms.

**Prerequisite(s):** At least a C- in CS 272 and C S 278.

**C S 375. Introduction to Intelligent Agents Using Science Fiction****3 Credits**

This course uses science-fiction movies to introduce fundamental principles and techniques in agents and multi-agent systems. It covers game theory, decision theory, machine learning, and distributed systems.

**C S 409. Independent Study****1-6 Credits (1-6)**

Faculty supervised investigation, to culminate in a written report. May be repeated up to 6 credits.

**Prerequisite(s):** Written agreement with faculty supervisor.

**C S 419. Computing Ethics and Social Implications of Computing****1 Credit**

An overview of ethics for computing majors includes: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems. S/U Grading (S/U, Audit).

**Corequisite(s):** C S 448 or C S 449.

**C S 448. Senior Project****4 Credits**

Capstone course in which C S majors work in teams and apply computer science skills to complete a large project. Consent of Instructor required. Restricted to: C S majors.

**Prerequisite(s):** Senior standing.

**Corequisite(s):** C S 419.

**C S 449. Senior Thesis****4 Credits**

Capstone course in which C S majors apply computer science skills to complete a research project, culminating in a written thesis report. Consent of Instructor required. Restricted to: C S majors.

**Prerequisite(s):** Consent of thesis adviser.

**Corequisite(s):** C S 419.

**C S 450. C Programming****3 Credits (2+3P)**

Programming in the C language. More advanced than C S 150. Recommended for nonmajors only. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**C S 451. C++ Programming****3 Credits**

Programming in the C language. More advanced than C S 151. Recommended for nonmajors only. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**C S 452. Java Programming****3 Credits (2+2P)**

Programming in the Java language. More advanced than C S 152. Recommended for nonmajors only. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**C S 453. Python Programming I****3 Credits**

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. More advanced than C S 153. May be repeated up to 3 credits.

**Prerequisite(s):** Understanding of college algebra or higher.

**C S 454. Python Programming II****3 Credits**

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

For graduate students only. Has more advanced work than C S 154, and does not count towards CS major requirements. May be repeated up to 3 credits. Graduate standing. Not for CS students.

**Prerequisite(s):** C S 153 or C S 453.

**C S 455. Internet Programming I****3 Credits**

This course is an introduction to programming for the Web in PHP and Javascript, covering fundamental web scripting ideas, CSS, data types and variables, functions, simple object creation and usage. Javascript usage will focus on dynamic page content. No prior programming experience is required, though a basic understanding of HTML will be assumed. For graduate students only. Has more advanced work than C S 155. Does not count towards CS major requirements. May be repeated up to 3 credits. Graduate standing. Not for CS students. Restricted to: exclude CS majors.

**Prerequisite(s):** MATH 120 and a basic understanding of HTML.

**C S 456. Internet Programming II****3 Credits**

This course covers advanced web scripting, including Javascript with AJAX, PHP integration with databases, object oriented features of PHP and Javascript, advanced CSS usage, and using web application frameworks. For graduate students only. Has more advanced work than C S 156. Does not count towards CS major requirements. May be repeated up to 3 credits. Graduate standing. Not for CS students. Restricted to: exclude CS majors.

**Prerequisite(s):** C S 155 or C S 455.

**C S 457. Topics in Software Programming and Applications****3 Credits (2+2P)**

Current topics in computer programming and software applications. Topic announced in the Schedule of Classes. More advanced than C S 157. recommended for non-majors only. May be repeated if subtitle is different.

**Prerequisite(s):** Graduate standing.

**C S 458. R Programming I****3 Credits**

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used. For graduate students only. Has more advanced work than C S 158. Does not count towards CS major requirements. May be repeated up to 3 credits.

**Prerequisite(s):** Good understanding of college algebra or higher.

**C S 459. R Programming II****3 Credits**

This course covers advanced R programming, including advanced data collection processing, advanced data visualizations, object oriented features of R, and file processing. It is recommended that students have one statistics course before taking this course. For graduate students only. Has more advanced work than C S 159, and does not count towards CS major requirements. May be repeated up to 3 credits. Crosslisted with: C S 469. Graduate standing. Restricted to: exclude computer science majors.

**Prerequisite(s):** C S 158 or C S 458.

**C S 460. Computer Science I Transition****3 Credits**

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For C S graduate students only; cannot be used to meet a C S student's program of study. Taught with C S 172. Consent of Instructor required. Crosslisted with: C S 172.

**C S 462. Object Oriented Programming Transition****3 Credits**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 463. Introduction to Data Structures Transition****3 Credits**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 464. Machine Programming and Organization Transition****3 Credits**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 465. Discrete Math for Computer Science Transition****3 Credits**

Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 172 or C S 460 or consent of instructor.

**C S 466. Compilers and Automata Transition****3 Credits**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For C S graduate students only; cannot be used in a student's program of study. Consent of instructor required.

**Prerequisite(s):** At least a C in C S 271 or C S 462, in C S 272 or C S 463, in C S 273 or C S 464, in C S 278 or C S 465, or consent of instructor.

**C S 468. Software Development Transition****3 Credits**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. Cannot be used in a C S student's program of study. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 271 or C S 462, in C S 272 or C S 463, or consent of instructor.

**C S 469. Data Structure and Algorithms Transition****3 Credits**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and red-black trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required. Restricted to: C S majors.

**Prerequisite(s):** At least a C- in C S 272 or C S 463, in C S 278 or C S 465, or consent of instructor.

**C S 471. Programming Language Structure I****3 Credits**

Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for C S graduate students.

**Prerequisite(s):** C- or better in C S 370 and C S 371.

**C S 473. Architectural Concepts I****3 Credits**

Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 273 and C S 370.

**C S 474. Operating Systems I****3 Credits**

Operating system principles and structures, and interactions with architectures. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 273, C S 371, and C S 372.

**C S 475. Artificial Intelligence I****3 Credits**

Fundamental principles and techniques in artificial intelligence systems. Intelligent Agents; solving problems by searching; local search techniques; game-playing agents; constraint satisfaction problems; knowledge representation and reasoning. Further selected topics may also be covered. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 476. Computer Graphics I****3 Credits**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for C S graduate students.

**Prerequisite(s):** At least C- in C S 370 or C S 371.

**C S 477. Digital Game Design****3 Credits**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Not for C S graduate students. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C S 371 or consent of instructor.

**C S 478. Computer Security****3 Credits**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. May be repeated up to 3 credits.

**Prerequisite(s):** At least a C- in C S 272, C S 273 or consent of instructor.

**C S 479. Special Topics****1-6 Credits**

Topic announced in the Schedule of Classes. May be repeated if subtitle is different. Not for C S graduate students. May be repeated up to 6 credits.

**C S 480. Linux System Administration****3 Credits**

Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.

**C S 481. Visual Programming****3 Credits**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Not for C S graduate students.

**Prerequisite(s):** C- or better in C S 272 and C S 278.

**C S 482. Database Management Systems I****3 Credits**

Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 483. Introduction to Robotics****3 Credits**

Basic AI-based robotic architecture and concepts, with an emphasis on building and programming mobile robots. Not for C S graduate students. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 272 and C S 273.

**C S 484. Computer Networks I****3 Credits**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for C S graduate students. Consent of Instructor required.

**Prerequisite(s):** At least a C- in C S 272 and CS 273.

**C S 485. User Interface Design****3 Credits**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Not for C S graduate students. May be repeated up to 3 credits.

**Prerequisite(s):** At least C- in C S 371.

**C S 486. Bioinformatics****3 Credits**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics. Not for C S graduate students.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 487. Applied Machine Learning I****3 Credits**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Not for Graduate Majors. Crosslisted with: C S 519.

**Prerequisite(s):** At least a C- in C S 272, MATH 191G; or consent of instructor.

**C S 488. Introduction to Data Mining****3 Credits**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Taught with C S 508.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 489. Bioinformatics Programming****3 Credits**

Application of computer programming languages to address data processing and analysis problems in modern molecular biology. R/Perl/Python programming; Web API programming. Automatic manipulation of next generation sequence data, analysis of large gene expression tables, access to online biological databases, performing statistical analysis, and visualization of data and results. Taught with C S 509.

**Prerequisite(s):** At least a C- in C S 272 and C S 278.

**C S 491. Parallel Programming****3 Credits**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for C S graduate students.

**Prerequisite(s):** C- or better in C S 370 or consent of instructor.

**C S 493. Algorithm Design and Implementation****3 Credits**

This course introduces the basic knowledge of designing classical algorithms and implementing these algorithms using a programming language. In particular, the course teaches various data structures, including graphs and balanced binary search trees, and efficient schemes to implement these data structures. This course also teaches basic algorithm design techniques including divide-and-conquer, greedy scheme, and dynamic programming. This course covers graph algorithms, including graph traversals (depth-first search and breadth-first search), connectivity, shortest paths, and minimum spanning trees. May be repeated up to 3 credits. Graduate standing. Not for CS students. Restricted to: C S majors.

**Prerequisite(s):** At least a C- in C S 272, or Consent of Instructor.

**C S 494. Introduction to Smart Grids****3 Credits**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids.

**Prerequisite(s):** At least a C- in C S 272 and a C- in E E 201 or 280; or Consent of instructor.

**C S 496. Cloud and Edge Computing****3 Credits**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Not for graduate CS majors. Crosslisted with: C S 522.

**Prerequisite(s):** A C- in C S 372; background in C S 484/504 is preferred or consent of instructor.

**C S 502. Database Management Systems I****3 Credits**

Database design and implementation; models of database management systems; privacy, security, protection, recovery; requires more advanced graduate work than C S 482. Students are expected to have solid knowledge of data structures and discrete mathematics.

**C S 503. Introduction to Robotics****3 Credits**

Basic AI-based robotic architectures and concepts, with an emphasis on building and programming mobile robots; requires more advanced graduate work than C S 483. Students are expected to have solid knowledge of data structures and machine-level programming.

**C S 504. Computer Networks I****3 Credits**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; requires more advanced graduate work than C S 484. Students are expected to have solid knowledge of data structures, machine-level programming. Knowledge of statistics (at the level of STAT 371 or 470) is recommended.

**C S 505. Artificial Intelligence I****3 Credits**

Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; requires more advanced graduate work than C S 475. Students are expected to have strong knowledge of algorithms and data structures (at the level of C S 372).

**C S 506. Computer Graphics I****3 Credits**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Requires more advanced graduate work than C S 476. Students are expected to have knowledge of compilers design and software engineering equivalent to CS 370 and CS 371.

**C S 508. Introduction to Data Mining****3 Credits**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Students are expected to have a preparation in Discrete Mathematics and Data Structures equivalent to C S 272 and C S 278. Requires more advanced graduate work than C S 488. Crosslisted with: C S 488.

**C S 509. Bioinformatics Programming****3 Credits**

Application of computer programming languages to address data processing and analysis problems in modern molecular biology. R/Perl/Python programming; Web API programming. Automatic manipulation of next generation sequence data, analysis of large gene expression tables, access to online biological databases, performing statistical analysis, and visualization of data and results. Requires a preparation in discrete mathematics and data structures equivalent to C S 272 and C S 278. Taught with C S 489.

**C S 510. Automata, Languages, Computability****3 Credits**

Regular and context-free languages, pushdown and finite-slate automata, turing machines, models of computation, halting problems. Students are expected to have knowledge of compilers design and algorithms equivalent to C S 370 and C S 372.

**C S 511. Logic and Constraint Logic Programming****3 Credits**

Declarative programming techniques; foundations of logic programming; programming in Prolog; constraint logic programming; application of logic and constraint programming; requires more advanced graduate work than C S 472. Students are expected to have knowledge of data structures and discrete mathematics equivalent to C S 272 and C S 278.

**C S 512. Computer Systems Modeling and Simulation****3 Credits**

Basic concepts of modeling computer systems: continuous and discrete time models, states and transition, probabilistic models. Structures of simulation programs, time driven and event driven simulation, simulation on captured and synthetic traces, generation of random variables, queuing models, Markov chains, random walks, Poisson, Markov, renewal branching and Brownian motion processes, model validation and data analysis; requires more advanced graduate work than C S 492. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

**C S 513. Computer Security****3 Credits**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Recommended knowledge of materials in C S 272 and C S 273. May be repeated up to 3 credits.

**Prerequisite(s):** At least a C in C S 273 or consent of instructor.

**C S 514. Introduction to Smart Grids****3 Credits**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Requires more advanced work than C S 494.

**Prerequisite(s):** At least a C- in C S 272 and a C- in E E 201 or 280; or Consent of instructor.

**C S 515. User Interface Design****3 Credits**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Requires more advanced graduate work than C S 485 with an emphasis on studying recent research in human-computer interaction. Students are expected to have knowledge of software engineering equivalent to C S 371. May be repeated up to 3 credits.

**C S 516. Bioinformatics****3 Credits**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; requires more advanced graduate work than C S 486. Students are expected to have a knowledge of algorithms and data structures equivalent to C S 372 or exposure to Biology (equivalent to BIOL 221 or BIOL 311).

**C S 517. Digital Game Design****3 Credits**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Requires more advanced graduate work than C S 477 with deeper attention to a team game project. May be repeated up to 3 credits.

**C S 518. Visual Programming****3 Credits**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Requires more advanced graduate work than C S 481. May be repeated up to 3 credits.

**Prerequisite(s):** at least a C in C S 272 and C S 278.

**C S 519. Applied Machine Learning I****3 Credits**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Crosslisted with: C S 487.

**C S 521. Parallel Programming****3 Credits**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; requires more advanced graduate work than C S 491. Students are expected to have knowledge of programming and machine organization equivalent to C S 271 and C S 273.

**C S 522. Cloud and Edge Computing****3 Credits**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Might have additional requirements for graduate students. Crosslisted with: C S 496.

**Prerequisite(s):** background in C S 484/504 is preferred or consent of instructor.

**C S 570. Analysis of Algorithms****3 Credits**

Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

**C S 571. Programming Language Structure II****3 Credits**

Formal semantics of programming languages. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372, and knowledge of principles of programming languages equivalent to C S 471.

**C S 572. Advanced Algorithms****3 Credits**

Design, analysis, and use of important algorithms and data structures.

**Prerequisite:** C S 570 or consent of instructor.

**C S 573. Architectural Concepts II****3 Credits**

Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474. Crosslisted with: E E564.

**C S 574. Operating Systems II****3 Credits**

Advanced topics related to operating system principles, guided by the current literature. Students are expected to have knowledge of computer architectures and operating systems equivalent to C S 473 and C S 474.

**C S 575. Artificial Intelligence II****3 Credits**

Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Students are expected to have knowledge of artificial intelligence equivalent to C S 475.

**C S 579. Special Topics****1-6 Credits**

Topic announced in the Schedule of Classes.

**C S 581. Advanced Software Engineering****3 Credits**

Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures, templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Students are expected to have knowledge of software engineering equivalent to C S 371.

**C S 582. Database Management Systems II****3 Credits**

Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Students are expected to have knowledge of data base management systems equivalent to CS 482.

**C S 584. Computer Networks II****3 Credits**

Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Students are expected to have knowledge of computer networks equivalent to C S 484, and of statistics equivalent to STAT 371 or STAT 470.

**C S 586. Algorithms in Systems Biology****3 Credits**

The course will introduce important algorithms and computational models used in systems biology to study molecular mechanisms for cellular dynamics, processes, and systems. Cellular processes, such as metabolism and signal transduction, are studied as systems and networks quantitatively from high throughput molecular measurements. The topics include molecular biological systems, network alignment, model simulation, network inference, model optimization, and hybrid models. Students will be able to construct models and analyze their properties in the context of molecular biological systems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

**C S 589. Special Research Problems****1-6 Credits**

Faculty-supervised investigation, to culminate in a written report. May be repeated; maximum of 6 credits may be applied toward M.S. degree. Restricted to majors.

**Prerequisite:** written agreement with faculty supervisor.

**C S 598. Master's Project****1-6 Credits**

Project-oriented capstone course to be completed by M.S. students under supervision of their advisor. Maximum of 6 credits may be applied toward M.S. degree. Restricted to C S majors.

**Prerequisite:** written agreement with instructor.

**C S 599. Master's Thesis****1-6 Credits (1-6)**

Thesis to be developed by M.S. Students under supervision of their advisor. May be repeated for a maximum of 6 credits. Restricted to majors.

**Prerequisite:** consent of instructor.

**C S 600. Pre-dissertation Research****1-15 Credits**

Pre-dissertation research.

**C S 700. Doctoral Dissertation****1-15 Credits**

Dissertation.

## CAST-CHILD ADVOCACY STUDIES (CAST)

**CAST 201. Introduction to Child Advocacy****3 Credits**

This is the introductory course for child advocacy studies (CAST). It covers different models for understanding child maltreatment, types and indicators of child maltreatment, controversial topics in the field, and issues and laws related to child maltreatment in various countries around the world. Students will develop critical thinking and analytical skills in assessing child maltreatment. Restricted to Dona Ana campus only.

**CAST 202. Professional and Systems Responses to Child Maltreatment**  
**3 Credits**

Course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; and current research and controversial issues affecting the field. Restricted to Dona Ana campus only.

**Prerequisite(s):** CAST 201.

**CAST 203. Prevention, Trauma Informed Treatment and Advocacy**  
**3 Credits**

The purpose of this course is to prepare students to recognize the effects of child maltreatment and apply interventions strategies for children and their families. Multidisciplinary approaches to prevention, advocacy and treatment of child maltreatment survivors will be presented and discussed. Topics include violence prevention research, interdisciplinary family programs, how to advocate for survivors of child abuse, case management, working with families, mental health service and controversial issues.

**Prerequisite(s):** CAST 201.

**CAST 301V. Introduction to Child Advocacy****3 Credits**

Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. Taught with MSW 590. Cannot receive credit for CAST 301 and MSW 590.

**CAST 302. Professional and Systems Responses to Child Maltreatment**  
**3 Credits**

Course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; current research and controversial issues effecting the field. Students majoring in social work, criminal justice, education, sociology, psychology, nursing, and other areas will enhance their capacity to strengthen the safety net that protects children.

**Prerequisite(s):** CAST 301V.

**CAST 303. Prevention, Trauma Informed Treatment and Advocacy**  
**3 Credits**

The purpose of this course is to prepare students to recognize the effects of child maltreatment and to apply intervention strategies for children and their families. Multidisciplinary approaches to prevention, advocacy, and treatment of child maltreatment survivors will be presented and discussed. Topics include violence prevention research, interdisciplinary family programs, how to advocate for survivors of child abuse, short- and long-term effects of child abuse, case management, working with families, mental health services and controversial issues. Crosslisted with: FCS 300

**Prerequisite(s):** CAST 301V.

**CAST 501. Introduction to Child Advocacy****3 Credits**

This is the introductory course for child advocacy studies (CAST). It covers different models for understanding child maltreatment, types and indicators of child maltreatment, controversial topics in the field, and issues and laws related to child maltreatment in various countries around the world. Students will develop critical thinking and analytical skills in assessing child maltreatment at the graduate level.

**CAST 502. Professional and Systems Responses to Child Maltreatment**  
**3 Credits**

This graduate level course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; and current research and controversial issues affecting the field.

**CAST 503. Prevention, Trauma Informed Treatment and Advocacy**  
**3 Credits**

The purpose of this course is to prepare graduate students to recognize the effects of child maltreatment and apply interventions strategies for children and their families. Multidisciplinary approaches to prevention, advocacy and treatment of child maltreatment survivors will be presented and discussed.

**Prerequisite(s):** A "B" or better in CAST 501.

## CCDE-DEVELOPMENTAL ENGLISH (CCDE)

### CCDE 105 N. Effective Communication Skills

#### 4 Credits (3+2P)

Instruction and practice in basic communication, to include written and oral presentations. Develops thinking, writing, speaking, reading, and listening skills necessary for successful entry to college and university classes. Provides laboratory. RR applicable.

### CCDE 110 N. General Composition

#### 4 Credits (3+2P)

Instruction and practice in preparation for college-level writing. Students will develop and write short essays. Provides laboratory. May be repeated up to 4 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

## CCDL-DEVELOPMENTAL ESL (CCDL)

### CCDL 101 N. Basic Skills in English as a Second Language I

#### 4 Credits (3+2P)

Developmental studies course for ESL students. Development of basic skills in speaking, listening, reading, and writing English as a second language with emphasis on speaking and listening. Pronunciation stressed. Course intended for U.S. citizens and residents who are nonnative speakers of English.

**Prerequisite:** English language screening or consent of instructor.

### CCDL 103 N. Basic Skills in English as a Second Language II

#### 4 Credits (3+2P)

Continuation of CCDL 101N for ESL students. Course intended for U.S. citizens and residents who are nonnative speakers of English.

**Prerequisite:** English language screening or consent of instructor.

### CCDL 105 N. Intermediate Skills in English as a Second Language I

#### 4 Credits (3+2P)

Intermediate level with emphasis on reading and writing. Grammar and syntax stressed. Course intended for U.S. citizens and residents who are nonnative speakers of English.

**Prerequisite:** English language screening or consent of instructor.

### CCDL 107 N. Intermediate Skills in English as a Second Language II

#### 4 Credits (3+2P)

Continuation of CCDL 105N. Course intended for U.S. citizens and residents who are nonnative speakers of English.

**Prerequisite:** English language screening or consent of instructor.

## CCDM-DEVELOPMENTAL MATHEMATICS (CCDM)

### CCDM 100 N. Mathematics Preparation for College Success

#### 1-4 Credits

Mathematics skills course designed for college students with math skills insufficient for success in CCDM 103N. May be repeated for a maximum of 4 credits. RR applicable.

### CCDM 103 N. Pre-Algebra

#### 4 Credits (3+2P)

Fundamental mathematics operations and arithmetic computations. Introduction to algebra and applied geometry. Provides laboratory and individualized instruction. RR applicable.

### CCDM 105 N. Mathematics Preparation and Pre-Algebra

#### 5 Credits (4+2P)

A total immersion course that combines CCDM 100N and CCDM 103N using tutorials, manipulatives, and classroom instruction. Completion of this class is equivalent to the completion of CCDM 100N and CCDM 103N. Restricted to: Community Colleges only.

**Prerequisite(s):** Math Placement Exam.

### CCDM 112 N. Developmental Algebra I

#### 4 Credits (3+2P)

Fundamental algebra operations, algebraic expressions, solving linear equations, systems of equations and applications of linear equations. Introduction to exponents and polynomials. Provides laboratory instruction. Completion of CCDM 112N and CCDM 113N is equivalent to completion of CCDM 114N. Graded: Traditional with RR. Traditional Grading with RR. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of C or better in CCDM 103N or CCDM 105N or adequate placement score.

### CCDM 113 N. Developmental Algebra II

#### 4 Credits (3+2P)

Fundamental algebra operations, polynomials, factoring, solving quadratics by factoring, rational expressions, exponents and radical expressions (continuation of CCDM 112N). Provides laboratory instruction. Completion of CCDM 112N and CCDM 113N is equivalent to completion of CCDM 114N. Graded: Traditional with RR. Restricted to: Community Colleges only.

**Prerequisite(s):** Grade of C or better in CCDM 112N or consent of instructor.

### CCDM 114 N. Algebra Skills

#### 4 Credits (3+2P)

Fundamental algebra operations: algebraic expressions, solving linear and quadratic equations, factoring, radicals, exponents. Provides laboratory and individualized instruction. Completion of CCDM 114N meets basic skills requirement. Graded: Traditional with RR. Traditional Grading with RR. Restricted to Community Colleges campuses only.

**Prerequisite(s):** C or better in CCDM 103N or CCDM 105N or adequate placement score.

## CCDR-DEVELOPMENTAL READING (CCDR)

### CCDR 101 N. Introduction to Basic Reading

#### 4 Credits (3+2P)

Provides basic reading skills through comprehension and vocabulary development. Emphasis on oral language literacy and reading fluency. Course earns institutional credit but will not count toward degree requirements. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Appropriate placement score.

### CCDR 103 N. Comprehensive Reading Development

#### 4 Credits (3+2P)

Provides integration of basic reading skills, including vocabulary development, text comprehension, and critical reading skills. Course earns institutional credit but will not count towards degree requirements. May be repeated up to 4 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Appropriate placement score.

**CCDR 105 N. Fundamentals of Academic Reading.****3 Credits (2+2P)**

Fundamentals of academic reading skills. Emphasis on vocabulary development and text comprehension through literature based instruction. Course earns institutional credit but will not count towards degree requirements. Graded: Traditional with RR. May be repeated up to 3 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Appropriate placement score.

**CCDR 110 N. Effective College Reading****3 Credits (2+2P)**

Provides a variety of strategies for effective reading and studying at the college level. Emphasis on reading across disciplines. Course earns institutional credit but will not count towards degree requirements. Graded: Traditional with RR. May be repeated up to 3 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Appropriate placement score.

## CCDS-DEVELOPMENTAL SKILLS (CCDS)

**CCDS 109 N. Study Skills for Reading****1-3 Credits**

Individualized reading skill strategies necessary for success in college classroom. May be repeated for a maximum of 3 credits. Graded traditional or S/U.

**CCDS 111 N. Study Skills for Math****1-3 Credits**

Individualized study skill strategies necessary for success in the math classroom. May be repeated for a maximum of 3 credits.

**CCDS 113 N. Study Skills for English****1-3 Credits**

Individualized study skill strategies necessary for success in the composition classroom. May be repeated for a maximum of 3 credits.

## CHEF-CULINARY ARTS (CHEF)

**CHEF 101. Culinary Arts Kitchen Orientation****3 Credits**

Provides students with basic information and skills necessary for success in the Culinary Arts program. Students learn basic kitchen routines, safety and sanitation, professional conduct and deportment, standard kitchen calculations, knife handling, and are introduced to the laboratories for initial cooking experiences. Restricted to Community Colleges campuses only.

**CHEF 125. Introductory Cake Decorating****1 Credit**

Introduction to the professional cake decorating techniques used by pastry chefs. Basic skills of piping a variety of icings into different patterns are taught. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Consent of instructor.

**CHEF 126. Intermediate Cake Decorating****1 Credit**

Introduction to more advanced professional cake decorating techniques used by pastry chefs. Fondant work and more complex decorating schemes are taught. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEF 125.

**CHEF 127. Chocolate Work****1 Credit**

Introduction to working with chocolate utilizing a variety of methods. Tempering, forming, molding, and other professional techniques will be taught. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Consent of Instructor.

**CHEF 128. Advanced Chocolate Work****1 Credit**

More advanced treatments of chocolate are explored and professional techniques for the chocolatier are developed. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEF 127.

**CHEF 129. Wedding Cake Design and Construction****1 Credit**

Basic skills in designing wedding (or other specialty event) cakes. Includes shaping, icing selection, decorating scheme, presentation, transportation, and remote set up. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEF 125 and CHEF 126.

**CHEF 155. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**CHEF 165. Math for Kitchen Operations****3 Credits**

Fundamental mathematical concepts and computations, including measurement, recipe scaling and conversions, metric unit conversion, ingredient yield calculations, ratios and cost extensions are covered. Examples of basic mathematical calculations use kitchen and food service functions, as well as situations to demonstrate principles.

**CHEF 211. Food Production Management I****3 Credits (2+2P)**

Introduction to kitchen design, workflow, and commercial equipment. Techniques, methods, and application of basic food production principles. Practical experience in cooking processes from a managerial viewpoint. Crosslisted with: HOST 211. Restricted to Community Colleges only.

**CHEF 212. Food Production Management II****3 Credits (2+2P)**

Selection and use of ingredients. Demonstration and application of classical and modern cooking and preparation techniques. Management techniques for kitchen personnel. Recipe design and analysis. Crosslisted with: HOST 212. Restricted to Community Colleges only.

**Prerequisite(s):** CHEF 211 or consent of instructor.

**CHEF 213. Bakery Management I****3 Credits (2+2P)**

Fundamentals of baking from a supervisory/management perspective. Exposure to commercial equipment and processes. Introduction to commercial alternatives to scratch-preparation methods. Crosslisted with: HOST 213. Restricted to Community Colleges only.

**CHEF 214. Bakery Management II****3 Credits (2+2P)**

Advanced techniques and management of bakery operations are explored. Students learn classical forms and techniques. Modern methods of preparing traditional pastry and baked goods are introduced. Crosslisted with: HOST218. Restricted to Community Colleges only.

**Prerequisite(s):** CHEF 213 or consent of instructor.

**CHEF 233. Culinary Arts Fundamentals I****4 Credits (1+9P)**

Introduction to the basics of culinary arts, including ingredients recognition, cooking methods and techniques, knife usage, preparation of basic stocks, mother sauces, starches and vegetables. Students will participate in laboratory work designed to create an understanding of the professional role of the culinarian. Preparation and production of food products integral to service to guests is incorporated in the course. May be repeated up to 4 credits. Consent of Instructor required. Restricted to: CHEF, HOST, HSMG, HOCH majors. Restricted to Community Colleges campuses only.

**CHEF 234. Culinary Arts Fundamentals II****4 Credits (1+9P)**

Continuation of introductory course focusing on meat cookery, daughter sauces, cold food preparation, poultry and seafood. Safe use of equipment is emphasized while experiencing differing methods of preparation and cooking. Preparation and production of food products integral to service of guests is incorporated in this course. May be repeated up to 4 credits. Restricted to: HOST, HSMG, CHEF majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEF 233 with a grade of "C-" or better.

**CHEF 235. Advanced Culinary Arts I****4 Credits (1+9P)**

Exploration and experience in preparation techniques beyond the basic level. Nutritional components of food are discussed, as in the application of good nutrition practices in recipe design. Students are encouraged to use creative methods to expand the individual's culinary expressions. Prepares food products for service to guests in both bulk feeding and individual service settings. Plans, prepares, serves and critiques meals provided for students, faculty and staff. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** CHEF 234 with a grade of "C" or better if course has been previously taken. Restricted to: CHEF majors. Restricted to Community Colleges campuses only.

**CHEF 236. Advanced Culinary Arts II****4 Credits (1+9P)**

Advanced techniques and experimental use of food combinations to enhance the student's repertoire of skills and abilities. Utilizes knowledge to develop recipes for unique products. Plans, prepares, serves and critiques meals provided for students, faculty and staff. Restricted to: CHEF majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEF 235 with a grade of "C" or better.

**CHEF 237. Banquet/Catering Production****3 Credits (1+6P)**

Planning and implementation of the culinary aspects of catered functions. Development of time schedules, work assignments and service plans for catered events and banquet functions. Production of food items in appropriate quantities for catered events. Costing and control functions are covered. May be repeated up to 6 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of "C" or above in CHEF 233.

**CHEF 240. Baking Fundamentals I****4 Credits (1+9P)**

Introduction to baking techniques, measurement and use of ingredients; equipment use and chemical reactions inherent in the baking process. Production of simple desserts and baked goods. Introduction to working with bread doughs. Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

**Corequisite(s):** CHEF 233.

**CHEF 241. Baking Fundamentals II****4 Credits (1+9P)**

More advanced baking and bread making techniques are covered in this course with emphasis on the more advanced elements of quantity production. Students work with a variety of products and ingredients. Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** grade of "C" or above in CHEF 240.

**CHEF 242. Intermediate Baking I****4 Credits (1+9P)**

More advanced baking and pastry techniques are covered in this course with emphasis on the basic elements of patisserie production. Focus is on preparing students to work in a pastry kitchen. Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of "C" or above in CHEF 241.

**CHEF 243. Intermediate Baking II****3 Credits (1+6P)**

Continuation of work with basic elements of patisserie products including laminated doughs and filled products. Students prepare creams, custards, fillings and are introduced to cake assembly procedures.

Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of "C" or above in CHEF 242.

**CHEF 245. Pastry Art and Techniques****3 Credits (1+6P)**

Advanced skills for the pastry chef including pulled sugar work, spun sugar, chocolate art, pastillage, marzipan molding, butter carving and advanced decorating techniques are explored. Students prepare specialty items for display and competition. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHEF majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CHEF 240.

**CHEF 255. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to: CULI, HOST, HSMG majors. Restricted to Community Colleges campuses only.

**CHEF 256. International Cuisine****3 Credits (1+6P)**

Exploration into a variety of international cuisines is undertaken, including the cultural and historical backgrounds of the foods being prepared. Students work on developing themed menus and production plans for meals utilizing a single international cuisine. May be repeated up to 6 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of "C" or above in CHEF 233.

**CHEF 257. Garde Manger****3 Credits (1+6P)**

Traditional garde manger skills are taught, including plated salads, cold foods, entremets, pates, forcemeat, terrines, charcuterie and chaud froid work. The art and craft of food design, preparation and service are emphasized. May be repeated up to 3 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Grade of "C" or above in CHEF 233.

**CHEF 260. Nutrition for Chefs****3 Credits**

Aspects of basic human nutritional requirements are covered as are the applications of the standards to the cooking and baking. Meeting the USDA nutrient guidelines while preparing good tasting food is discussed, calorie, fat and sodium reduction techniques are explored.

**CHEM-CHEMISTRY (CHEM)****CHEM 100. Basic Chemistry****3 Credits**

For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.

**Prerequisite:** Enhanced ACT composite score of at least 18 or a grade of C or better in CCDM 114 N.

**CHEM 101. General Supplemental Instruction I****1 Credit**

Collaborative workshop for students in General Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 111G.

**CHEM 102. General Supplemental Instruction II****1 Credit**

Collaborative workshop for students in General Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 112G.

**CHEM 103. Principles of Supplemental Instruction III****1 Credit**

Collaborative workshop for students in CHEM 110G, Principles and Applications of Chemistry. Course does not count toward departmental degree requirements. May be repeated for maximum of 2 credits.

**Co-requisite:** CHEM 110G.

**CHEM 110G. Principles and Applications of Chemistry****4 Credits (3+3P)**

A survey of the properties and uses of the elements and their compounds. In addition to classical chemistry, attention is paid to the materials from which consumer products are made, to the production of energy, and to environmental considerations.

**Prerequisite:** 3 years of high school math or CCDM 114N.

**CHEM 111G. General Chemistry I****4 Credits (3+3P)**

Descriptive and theoretical chemistry. CHEM 111G/112G are General Education alternative to CHEM 110G.

**Prerequisite:** (1) grade of C or better in MATH 120 or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 120; and (2) one of the following: B or better in a second semester high school chemistry course, or grade of at least C in CHEM 100, or an enhanced ACT score of at least 22.

**CHEM 112G. General Chemistry II****4 Credits (3+3P)**

Descriptive and theoretical chemistry. CHEM 111G/112G are General Education alternative to CHEM 110G.

**Prerequisite(s):** CHEM 111G.

**CHEM 115. Principles of Chemistry I****4 Credits (3+3P)**

Detailed introduction to analytical, inorganic and physical aspects of chemistry; both descriptive and theoretical explanations. Structured for chemistry and biochemistry majors but appropriate for other physical and life science students. CHEM 115/116 are General Education alternatives to CHEM 110G.

**Prerequisite:** Eligible to take MATH 190G and an ACT composite score of 22 or higher.

**CHEM 116. Principles of Chemistry II****4 Credits (3+3P)**

Recommended for chemistry majors and other qualified students. CHEM 115/116 are General Education alternatives to CHEM 110G.

**Prerequisites:** grade of C or better in CHEM 115.

**CHEM 210. Chemistry for the Allied Health Sciences****3 Credits**

Discussion and application of the established facts and concepts of general organic chemistry and biochemistry to acquire a molecular understanding of a variety of health related issues, from atmospheric ozone holes to human nutrition.

**Prerequisite:** CHEM 110G or CHEM 111G.

**CHEM 211. Organic Chemistry****4 Credits (3+3P)**

A one-semester survey for students requiring a brief coverage of important classes of organic compounds. May be repeated up to 4 credits.

**Prerequisite(s):** CHEM 112G.

**CHEM 217. General Chemistry III****3 Credits (2+3P)**

Quantitative aspects of general chemistry: solid state structure, equilibrium, thermodynamics, and kinetics. Required of chemical science majors who have taken CHEM 111G/112.

**Prerequisite:** CHEM 112G.

**CHEM 241. Introduction to Research****1-3 Credits (3+9P)**

Techniques and procedures of chemical research. May be repeated for a maximum of 3 credits.

**Prerequisites:** 8 credits of chemistry and a 3.0 GPA in chemistry.

**CHEM 242. Explorations in Chemistry****1 Credit**

Historical and current developments, careers in chemistry, computer applications and use of the library by chemists. To be completed before the end of the sophomore year. Graded S/U.

**CHEM 251. Special Topics in Chemistry****1-6 Credits (1-6)**

Specific subjects in Chemistry. These subjects will be announced in the 'Schedule of Classes'. It may be repeated under different topics for a maximum of 12 credits.

**CHEM 303. Organic Supplemental Instruction I****1 Credit**

Collaborative workshop for students in Organic Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 313.

**CHEM 304. Organic Supplemental Instruction II****1 Credit**

Collaborative workshop for students in Organic Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

**Corequisite:** CHEM 314.

**CHEM 313. Organic Chemistry I****3 Credits**

Nomenclature, uses, basic reactions, and preparation methods of the most important classes of aliphatic and aromatic compounds.

**Prerequisite:** CHEM 112G or CHEM 116.

**CHEM 314. Organic Chemistry II****3 Credits**

Nomenclature, uses, basic reactions, and preparation methods of the most important classes of aliphatic and aromatic compounds.

**Prerequisite:** C or better in CHEM 313.

**CHEM 315. Organic Chemistry Laboratory****2 Credits**

Techniques, preparative and analytical methods in organic chemistry.

**Prerequisite:** C or better in CHEM 313 or consent of instructor.

**Corequisite:** CHEM 314.

**CHEM 351. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**CHEM 356. Descriptive Inorganic Chemistry****3 Credits**

Occurrence and properties of the elements and the chemistry of their compounds. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 112G or CHEM 116 and CHEM 211 or CHEM 313.

**CHEM 357. Synthetic Inorganic Laboratory****2 Credits**

Explores synthesis and analysis of main group and transition metal inorganic compounds. Inorganic laboratory and spectroscopic techniques will be used.

**Prerequisites:** CHEM 356.

**CHEM 360. General Geochemistry****3 Credits**

Same as GEOL 360.

**CHEM 371. Analytical Chemistry****4 Credits (2+6P)**

The fundamentals of quantitative chemical analysis. May be repeated up to 4 credits.

**Prerequisite(s):** CHEM 112G or CHEM 116.

**CHEM 422. Environmental Chemistry****3 Credits**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: E S 422

**Prerequisite(s):** CHEM 112G and either CHEM 211 or CHEM 313.

**CHEM 424. Soil Chemistry****3 Credits**

Same as SOIL/GEOL 424.

**CHEM 431. Physical Chemistry****3 Credits**

Principles that govern the physical and chemical behavior of matter. May not be counted toward Bachelor of Science degree in Chemistry.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 212 or PHYS 222G or PHYS 214 or PHYS 216G.

**CHEM 431 H. Physical Chemistry Honors****3 Credits**

Same as CHEM 431. Additional work to be arranged.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 212G or PHYS 222G or PHYS 214 or PHYS 216G.

**CHEM 433. Physical Chemistry I****3 Credits**

Laws and theories underlying chemical phenomena.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 214 or PHYS 216G, or consent of instructor.

**CHEM 433 H. Physical Chemistry I Honors****3 Credits**

Same as CHEM 433. Additional work to be arranged.

**Prerequisite(s):** CHEM 116 or CHEM 217; MATH 192G; PHYS 214 or PHYS 216G, or consent of instructor.

**CHEM 434. Physical Chemistry II****3 Credits**

Laws and theories underlying chemical phenomena.

**Prerequisite:** CH E 302 or CHEM 433.

**CHEM 435. Physical Chemistry Laboratory****2 Credits**

**Prerequisite:** concurrent registration in CHEM 434.

**CHEM 441. Advanced Research****1-3 Credits (3+9P)**

Investigation of chemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

**Prerequisites:** consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

**CHEM 443. Senior Seminar****1 Credit**

Discussions of current chemical research, impact of chemistry on society and/or ethics as applied to chemists. Each student will present a written and an oral report on an approved topic.

**Prerequisite:** CHEM 431 or CHEM 433.

**CHEM 451. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**CHEM 455. Independent Studies****1-3 Credits**

Independent studies directed by consulting faculty.

**Prerequisite:** consent of instructor.

**CHEM 456. Inorganic Structure and Bonding****3 Credits**

Theoretical principles and a systematic study of the periodic table.

**Prerequisite:** CHEM 356 or CHEM 431 or CHEM 433.

**CHEM 466. Advanced Organic Chemistry****3 Credits**

Recent developments in synthesis and theoretical principles of organic chemistry.

**Prerequisite:** CHEM 314.**CHEM 466 H. Advanced Organic Chemistry Honors****3 Credits**

Same as CHEM 466. Additional work to be arranged.

**CHEM 471. Instrumental Methods of Analysis****4 Credits (3+3P)**

Analytical techniques, including optical and procedures.

**Prerequisites:** CHEM 371 and either PHYS 212G or PHYS 216G.**CHEM 500. Seminar in Inorganic Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 507. Chemistry of the Elements****3 Credits**

Discussion of the reactions and structures of inorganic compounds.

**CHEM 510. Seminar in Organic Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 514. Organic Structure Determination****3 Credits**

Modern spectroscopic techniques for characterization of organic compounds.

**CHEM 515. Modern Organic Chemistry****3 Credits**

Recent developments in synthesis and theoretical principles of organic chemistry.

**CHEM 516. Physical Organic Chemistry****3 Credits**

Physical organic chemistry.

**CHEM 517. Synthetic Organic Chemistry****3 Credits**

Synthetic methods in organic chemistry.

**CHEM 520. Seminar in Analytical Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 521. Chemical Instrumentation****3 Credits (2+3P)**

Theory and application of electronic devices to chemical analysis.

**CHEM 526. Advanced Analytical Chemistry****3 Credits**

Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.

**CHEM 527. Separations****3 Credits**

Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.

**CHEM 528. Electroanalytical Techniques****3 Credits**

Theory and application of modern electrochemical methods of analysis including voltammetry, amperometry, modern cyclic and pulse methods, and stripping analysis.

**CHEM 529. Spectrochemical Analysis****3 Credits**

Fundamentals, instrumentation, and applications of spectrochemical analysis.

**CHEM 530. Seminar in Physical Chemistry****1 Credit**

Current topics. May be repeated.

**CHEM 536. Chemical Thermodynamics****3 Credits**

First, second, and third laws of thermodynamics, and the concepts, interrelations, and applications of thermodynamic state functions.

**CHEM 537. Quantum Chemistry****3 Credits**

Fundamentals of quantum mechanics.

**Prerequisite:** consent of instructor.**CHEM 538. Chemical Kinetics****3 Credits**

Empirical analysis of rate measurements, collision theory, transition state theory, and chain reactions.

**CHEM 539. Spectroscopy****3 Credits**

Molecular spectroscopy for physical chemistry. Quantum mechanics applied to spectroscopy of polyatomic molecules: UV-VIs, IR, magnetic resonance. CHEM 537 desired but not required. Prerequisite: consent of instructor.

**Prerequisite:** consent of instructor.**CHEM 560. Discussions in Organic Chemistry****1 Credit**

Current research problems in organic chemistry. May be repeated. Graded S/U.

**CHEM 570. Discussions in Analytical Chemistry****1 Credit**

Current research problems in analytical chemistry. May be repeated. Graded S/U.

**CHEM 580. Discussions in Physical Chemistry****1 Credit**

Current research problems in physical chemistry. May be repeated. Graded S/U.

**CHEM 598. Special Research Programs****1-3 Credits**

Individual investigations, either analytical or experimental. Graded S/U.

**CHEM 599. Master's Thesis****15 Credits**

Thesis preparation.

**CHEM 600. Research****1-15 Credits**

Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

**CHEM 609. Topics in Inorganic Chemistry****1-3 Credits**

Selected topics of current interest designated by subtitle.

**CHEM 619. Topics in Organic Chemistry****1-3 Credits**

Selected topics of current interest designated by subtitle.

**CHEM 629. Advanced Topics in Analytical Chemistry****3 Credits**

Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.

**CHEM 639. Topics in Physical Chemistry****1-3 Credits**

Selected topics of current interest designated by subtitle.

**CHEM 650. Advanced Seminar****1 Credit**

Intended for students who have earned a master's degree or the equivalent. A discussion of current topics of interest in chemistry. May be repeated.

**CHEM 700. Doctoral Dissertation****17 Credits**

Dissertation preparation.

**CHIN-CHINESE (CHIN)****CHIN 111. Elementary Chinese I****4 Credits**

Mandarin Chinese for beginners.

**CHIN 112. Elementary Chinese II****4 Credits**

Mandarin Chinese for beginners.

**Prerequisite:** C or better in CHIN 111.

**CHIN 211. Intermediate Chinese I****3 Credits**

Speaking, reading and writing Mandarin Chinese. Restricted to Las Cruces campus only.

**Prerequisite(s):** C or better in CHIN 112.

**CHIN 212. Intermediate Chinese II****3 Credits**

Speaking, reading and writing Mandarin Chinese. Restricted to Las Cruces campus only.

**Prerequisite(s):** C or better in CHIN 211.

**CHIN 311. Advanced Chinese Language I****3 Credits**

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

**Prerequisite(s):** Grade of C or better in CHIN 211 and CHIN 212.

**CHIN 312. Advanced Chinese Language II****3 Credits**

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

**Prerequisite(s):** Grade of C or better in CHIN 311.

**CHME-CHEMICAL & MATERIALS ENGR (CHME)****CHME 101. Introduction to Chemical Engineering Calculations****2 Credits**

Introduction to the discipline of chemical engineering, including: an overview of the curriculum; career opportunities; units and conversions; process variables; basic data treatments; and computing techniques including computer programming and use of spreadsheets.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Restricted to Las Cruces campus only.

**CHME 102. Material Balances****2 Credits**

Perform material balances in single- and multi-phase, reacting and non-reacting systems under isothermal conditions.

**Prerequisite(s)/Corequisite(s):** CHEM 111G or CHEM 115. Prerequisite(s): MATH 190G, CHME 101.

**CHME 201. Energy Balances & Basic Thermodynamics****3 Credits**

Chemical Engineering energy balances; combined energy and material balances including those with chemical reaction, purge and recycle; thermochemistry; application to unit operations. Introduction to the first and second laws of thermodynamics and their applications. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** CHME 102, CHEM 115 or CHEM 111G, and MATH 192G.

**CHME 301. Chemical Engineering Thermodynamics I****3 Credits**

Applications of the first and second law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances.

**Prerequisite(s)/Corequisite(s):** CHME 392 or MATH 392. Prerequisite(s): CHME 201, MATH 291G. Restricted to: CHME majors.

**CHME 302. Chemical Engineering Thermodynamics II****2 Credits**

Continuation of CHME 301. Restricted to: CHME majors.

**Prerequisite(s):** CHME 301 AND (CHME 392 OR MATH 392).

**CHME 302 L. Thermodynamic Models of Physical Properties****1 Credit**

Computational analysis of thermodynamic models in a chemical process simulator, and comparison to experimental data. Specification of pseudo-components. Generation of physical properties by group contribution methods.

**Prerequisite(s)/Corequisite(s):** CHME 302.

**CHME 303. Chemical Engineering Thermodynamics****4 Credits**

Applications of the First Law and Second Law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances. Modeling of physical properties for use in energy and entropy balances, heat and mass transfer, separations, reactor design, and process control. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): CHME 201, MATH 291.

**CHME 305. Transport Operations I: Fluid Flow****3 Credits**

Theory of momentum transport. Unified treatment via equations of change. Shell balance solution to 1-D problems in viscous flow. Analysis of chemical engineering unit operations involving fluid flow. General design and operation of fluid flow equipment and piping networks.

**Prerequisite(s)/Corequisite(s):** CHME 392. Prerequisite(s): CHME 201, PHYS 215G, MATH 291G. Restricted to: CHME majors.

**CHME 306. Transport Operations II: Heat and Mass Transfer****4 Credits**

Theory of heat and mass transport. Unified treatment via equations of change. Analogies between heat and mass transfer. Shell balance solution to 1-D problems in heat and mass transfer. Analysis of chemical engineering unit operations involving heat transfer. Design principles for mass transfer equipment. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 305 and (CHME 392 or MATH 392).

**CHME 307. Transport Operations III: Staged Operations****3 Credits**

Theory of mass transport. Mass transfer coefficients. Analysis of chemical engineering unit operations involving mass transfer and separations. Equilibrium stage concept. General design and operation of mass-transfer equipment and separation sequences. Restricted to: CHME majors.

**Prerequisite(s):** CHME 302, CHME 306.

**CHME 311. Engineering Data Analysis****3 Credits**

Methodology and techniques associated with analyzing engineering data. Extensive spreadsheet use to analyze data and develop statistically significant conclusions based on the data. Data sets range from single variable experiments to multifactor regression analysis.

**Prerequisite(s):** MATH 192.

**CHME 323 L. Transport Operations and Instrumentation Laboratory I****1 Credit**

Laboratory experiments demonstrate the principles of process measurement and instrumentation through the determination of thermodynamic properties, transport phenomena properties, heat transfer, and material physical properties. Treatment of data includes regression techniques, analysis of error, and statistical analysis.

**Prerequisite(s)/Corequisite(s):** CHME 306. Prerequisite(s): STAT 371 or CHME 311. Restricted to: CHME majors.

**CHME 324 L. Transport Operations and Instrumentation Laboratory II****1 Credit**

Continuation of CHME 323L. Restricted to: CHME majors.

**Prerequisite(s):** CHME 323L.

**CHME 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 330, E E 330, E S 330, E T 330, I E 330, M E 330 and WERC 330

**CHME 352 L. Simulation of Unit Operations****1 Credit**

Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover pipe networks, pressure changers, heat exchangers, distillation columns, and chemical reactors.

**Prerequisite(s)/Corequisite(s):** CHME 307, CHME 441. Restricted to: CHME majors.

**CHME 361. Engineering Materials****3 Credits**

Bonding and crystal structure of simple materials. Electrical and mechanical properties of materials. Phase diagrams and heat treatment. Corrosion and environmental effects. Application of concepts to metal alloys, ceramics, polymers, and composites. Selection of materials for engineering design.

**Prerequisite(s):** (CHEM 111G or CHEM 114 or CHEM 115) and MATH 190G.

**CHME 391. Industrial Employment****1-2 Credits**

Employment in chemical, petroleum, food, biotechnology, materials, environmental, pharmaceutical, or other industry relevant to the discipline, with opportunity for professional experience and training in chemical engineering. Requires written report covering work period approved by employer. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHME, CH E majors.

**Prerequisite(s):** Consent of department head.

**CHME 392. Numerical Methods in Engineering****3 Credits**

Study and application of numerical methods in solving problems commonly encountered in engineering. The numerical methods are motivated by engineering problems rather than by mathematics. However, sufficient mathematical theory will be provided so that students can appreciate the insight into the techniques and their shortcomings of different methods. MATLAB will be used as the working environment for implementing and performing the numerical methods in computers. This course is an engineering elective open to all engineering majors. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 392.

**CHME 395V. Brewing Science and Society****3 Credits**

An overview of the science of brewing and the interrelationships between society, technology, business, and the evolution of the current beer market. Topics covered are history of brewing and the interrelationships between societal attitudes, technology, and cultural preferences; beer styles and evaluation techniques; production and characteristics of ingredients used in brewing; brewing unit operations; biochemistry of malting, mashing, and fermentation; engineering in the brewery; homebrewing; and societal and health issues related to beer and alcohol. Students must be at least 21 years of age by the first day of instruction of the semester to enroll in this course.

**CHME 412. Process Dynamics and Control****3 Credits**

Process modeling, dynamics, and feedback control. Linear control theory and simulation languages. Application of Laplace transforms and frequency response to the analysis of open-loop and closed-loop process dynamics. Dynamic response characteristics of processes. Stability analysis and gain/phase margins. Design and tuning of systems for control of level, flow, and temperature.

**Prerequisite(s):** CHME 441.

**CHME 423 L. Unit Operations Laboratory I****1 Credit**

Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control system instrumentation and development of empirical models from process data. Includes written and oral reports. Restricted to: CHME majors.

**Prerequisite(s):** CHME 307, CHME 441, CHME 324L.

**CHME 424 L. Process Control Laboratory****1 Credit**

Experiments with chemical engineering process control including the use of computer data acquisition and closed-loop process control. Covers control system instrumentation. Includes written and oral reports. Restricted to: CHME majors.

**Prerequisite(s):** CHME 412, CHME 423L.

**CHME 430. Environmental Management Seminar II****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 430, E E 430, E S 430, E T 430, I E 430, M E 430 and WERC 430

**CHME 441. Chemical Kinetics and Reactor Engineering****3 Credits**

Analysis and interpretation of kinetic data and catalytic phenomena. Applied reaction kinetics; ideal reactor modeling; non-ideal flow models. Mass transfer accompanied by chemical reaction. Application of basic engineering principles to design, operation, and analysis of industrial reactors.

**Prerequisite(s)/Corequisite(s):** CHME 307. Prerequisite(s): CHEM 313, CHME 302. Restricted to: CHME,CH E majors.

**CHME 443. Industrial Catalysis****3 Credits**

Fundamentals of catalytic processes, including chemistry, catalyst preparation, properties and reaction engineering. Addresses heterogeneous catalytic processes employed by industry. Detailed analysis of existing catalysts and catalytic reactions, and process design in chemical engineering.

**Prerequisite(s):** CHME 441.

**CHME 448. Industrial Safety****3 Credits**

An introduction to the fundamentals of chemical process safety, including toxicology, industrial hygiene, source models, fires and explosions, relief systems, hazard identification, risk assessment, environmental fate and transport, hazardous waste generation, pollution prevention, and regulatory requirements.

**Prerequisite(s):** CHEM 115 or CHEM 111G.

**CHME 449. Intellectual Property for Engineers and Scientists****3 Credits**

An overview of intellectual property with an emphasis on patents. Terminology, patentability requirements, invention disclosures, inventorship, scope of claims, patent application content and the patent prosecution process, and post-allowance matters including infringement and enforcement. Taught with CHME 549.

**Prerequisite(s):** CHEM 110G, CHEM 111G, or CHEM 115G; and senior standing in engineering or a fundamental science major; or consent of instructor.

**CHME 452. Chemical Process Design & Economic Evaluation****3 Credits**

Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. Restricted to: CHME,CH E majors.

**Prerequisite(s):** CHME 307, CHME 441.

**CHME 452 L. Chemical Process Simulation****1 Credit**

Construction and convergence of chemical processes in a process simulator. Students will understand how to access variables, define and converge design specifications and converge tear/recycle streams.

**Prerequisite(s)/Corequisite(s):** CHME 452. Prerequisite(s): CHME 352L. Restricted to: CHME majors.

**CHME 455. Chemical Plant Design****3 Credits**

Design and analysis of integrated process plants. Consideration given to optimizing performance, operability, reliability, safety, control, energy integration, and cost effectiveness. Requires written report covering solution of a capstone design problem. Restricted to: CHME majors.

**Prerequisite(s):** CHME 452.

**CHME 455 L. Chemical Plant Simulation****1 Credit**

Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control.

**Prerequisite(s)/Corequisite(s):** CHME 455. Prerequisite(s): CHME 412, CHME 452L. Restricted to: CHME majors.

**CHME 461. Calculation of Material and Molecular Properties****3 Credits**

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CHME 561.

**Prerequisite(s):** CHEM 116, MATH192G, (PHYS 214 or PHYS 216).

**CHME 462. MEMs, BioMEMs, and Nano Devices & Technologies****3 Credits**

Device-fabrication approaches and testing methodologies for micro-electro-mechanical (MEM) systems and nanoscale devices. Applications of such devices, and their working principles will also be part of this course. A laboratory component of this course will also be included. Taught with CHME 562. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** CH E 361, CHEM 111.

**CHME 463. Soft Matter****3 Credits**

Bulk soft matter assemblies including polymers, macromolecules, colloids, gels, vesicles, emulsions, surfactants, micelles, suspensions and liquid crystals. Self-assembly including molecular self-organization, supramolecular systems, encapsulation, self-assembled films and monolayers. Biological aspects of soft matter including biomacromolecules, cells and soft tissues. Surfaces, interfaces and interactions including thin films, Langmuir monolayers and wetting/dewetting. Physicochemistry and characterization of soft matter. Taught with CHME 563. Consent of Instructor required.

**Prerequisite(s):** CH E 302, CH E 305, CH E 361.

**CHME 464. Polymer Science & Engineering****3 Credits**

This course covers concepts in science and engineering of macromolecules, such as synthesis and chemistry, characterization of molecular weight, morphology, rheology, and mechanical behavior, structure and property relationships, and polymer processing. Taught with CHME 564. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 314.

**CHME 465. Rheology and Viscoelasticity****3 Credits**

Navier-Stokes equation; non-Newtonian fluids; flow fields; rheometry; viscoelastic models; non-linear viscoelasticity; material functions; complex fluids, including emulsions, suspensions and nanocomposites. Taught with CHME 565. Consent of Instructor required.

**Prerequisite(s):** CHME 306.

**CHME 467. Nanoscience and Nanotechnology****3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Taught with PHYS 520 and CH E 567. Crosslisted with: PHYS 520 and PHYS 467.

**Prerequisite(s):** (CHEM 116 or CHEM 112G), (PHYS 211G or PHYS 215G), (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard).

**CHME 468. Adsorption****3 Credits**

Introduction to adsorption science and technology, which includes adsorption equilibrium and kinetic theories, adsorbent materials and characterization, adsorption processes and design. Selected applications of adsorption processes in chemical and pharmaceutical industries and environmental protections will also be discussed. Taught with CHME 568. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 201.

**CHME 470. Introduction to Nuclear Energy****3 Credits**

Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology.

**Prerequisite(s):** CHEM 111G, MATH 192G.

**CHME 471. Health Physics****3 Credits**

Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis.

**Prerequisite(s):** MATH 192G, CHME 470.

**CHME 472. Detection Techniques for Radionuclides and Volatile Organic Compounds****3 Credits**

Basics of analytical techniques used to detect and quantify the presence of radionuclides, with focus on lung and whole-body counting by gamma-ray spectrometry and gas chromatography/mass spectrometry techniques. Course also covers sampling techniques, chain-of-custody methods, and includes hands-on instrument experience at the Carlsbad Environmental Monitoring & Research Center (CEMRC). Course fee required for travel to CEMRC.

**Prerequisite(s):** CHME 470.

**CHME 473. Nuclear Regulations and Compliance Practices****3 Credits**

Introduction, through the use of case studies, to the best technical compliance practices for regulations governing the siting, licensing, constructing, operating and decommissioning of nuclear fuel cycle facilities. Consent of Instructor required.

**Prerequisite(s):** MATH 191G, (CHEM 111G or CHEM 115), CHME 470.

**CHME 474. Power Plant Design****3 Credits**

Principles of electric power generation. Review of DC and AC systems, energy sources, and prime movers. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations.

**Prerequisite(s):** MATH 191G, CHEM 111G.

**CHME 475. Nuclear Reactor Theory****3 Credits**

An overview of the properties of nuclei, nuclear structure, radioactivity, nuclear reactions, fission, resonance reactions, moderation of neutrons, will be followed by mathematical treatment of the neutronics behavior of fission reactors, primarily from a theoretical, one-speed perspective. Criticality, fission product poisoning, reactivity control, reactor stability and introductory concepts in fuel management, slowing down and one-speed diffusion theory.

**Prerequisite(s):** (CHEM 112G or CHEM 116G) PHYS 215G, MATH 291G, CHME 470.

**CHME 476. Nuclear Fuel Cycles****3 Credits**

Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Consent of Instructor required.

**Prerequisite(s):** CHME 470.

**CHME 479. Corrosion and Degradation of Materials****3 Credits**

Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstructure on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors.

Corrosion in nuclear reactors and nuclear waste repositories.

**Prerequisite(s):** CHME 361.

**CHME 481. Biomedical Engineering and Engineering Healthcare****3 Credits**

Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. Taught with CHME 581. Restricted to: CHME,CH E majors.

**Prerequisite(s):** CHEM 116G, CHME 201.

**CHME 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Taught with CHME 585. Crosslisted with: AGRO 485 and HORT 486.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**CHME 486. Biofuels****3 Credits**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** CHME 201.

**CHME 488. Elements of XRD****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: PHYS 468.

**Prerequisite(s)/Corequisite(s):** . Prerequisite(s): a C- or better in PHYS 315 and PHYS 315 L.

**CHME 489. Introduction to Modern Materials****3 Credits**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties. Crosslisted with: PHYS 489.

**Prerequisite(s):** PHYS 315 or engineering equivalent.

**CHME 490. Senior Seminar****1 Credit**

Research seminar attended by graduate students is open to CHME undergraduates who are research active May be repeated up to 2 credits.

**Prerequisite(s)/Corequisite(s):** CHME 498. Prerequisite(s): Senior Standing. Restricted to: CHME,CH E majors.

**CHME 491. Special Topics****3 Credits**

Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated to a maximum of 6 credits under different subtitles listed in the Schedule of Classes. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHME,CH E majors.

**Prerequisite(s):** Consent of instructor.

**CHME 495. Brewing Science & Engineering****4 Credits (3+3P)**

Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economics of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Restricted to: CHME CH E majors.

**Prerequisite(s):** CHME 441, CHME 452.

**CHME 498. Undergraduate Research****1-3 Credits (1-3P)**

Provides an opportunity for undergraduate students to work in research or areas of special interest such as design problems and economic studies under the direction of a faculty member. Written report covering work required. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: CHME,CH E majors.

**Prerequisite(s):** Consent of instructor and department head.

**CHME 501. Graduate Thermodynamics for Chemical Engineers****3 Credits**

Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics. Restricted to: CHME,CH E majors.

**CHME 506. Graduate Transport Phenomena(s)****3 Credits**

Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence.

**CHME 513. Intermediate Chemical Engineering Data Analysis (s)****3 Credits**

Intermediate topics in the design and analysis of typical chemical engineering experiments. Topics covered include: linear models, constrained experimental space, non-linear models, model discrimination, and response surface methodologies. Restricted to: CHME,CH E majors.

**CHME 516. Numerical Methods in Chemical Engineering****3 Credits**

Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering.

**CHME 530. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Crosslisted with: C E 330, E E 330, I E 330.

**CHME 541. Chemical Kinetics and Reactor Engineering****3 Credits**

Same as CHME 441 with differentiated assignments for graduate students. Consent of Instructor required.

**Prerequisite(s):** Consent of Instructor.

**CHME 542. Graduate Reactor Analysis and Design (s)****3 Credits**

Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems.

**CHME 549. Intellectual Property for Engineers and Scientists****3 Credits**

An overview of intellectual property, including patents, trade secrets, copyright, and trademark. Specialized terminology; protectable subject matter and applicable legal standards; inventorship, authorship and ownership; application content and preparation; procedural and substantive application components; and infringement and enforcement. Taught with CHME 449.

**Prerequisite(s):** CHEM 111G or CHEM 115.

**CHME 561. Calculation of Material and Molecular Properties****3 Credits**

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CH E 461. Consent of Instructor required.

**Prerequisite(s):** CHEM 116, MATH 192G, and (PHYS 214 or PHYS 216G).

**CHME 563. Soft Matter****3 Credits**

The physiochemistry of soft materials including gels, polymers and colloids, self-assembly, intermolecular forces, and colloidal forces. Taught with CHME 463.

**Prerequisite(s):** CHME 302, CHME 305, CHME 361.

**CHME 564. Polymer Science & Engineering****3 Credits**

Synthesis, structure, property relationships of synthetic polymers. Taught with CHME 464. May be repeated up to 3 credits.

**Prerequisite(s):** CHME 201, CHEM 314.

**CHME 565. Rheology and Viscoelasticity****3 Credits**

This course is an introduction to rheology and viscoelasticity. In particular, the flow behavior of Non-Newtonian Fluids and Viscoelastic Fluids will be covered. Rheometry, the technique for characterization of fluids, will be discussed. Most of the course is quantitative and uses mathematical modeling. Taught with CHME 465.

**Prerequisite(s):** CHME 306.

**CHME 567. Nanoscience and Nanotechnology****3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Taught with CHME 467.

**Prerequisite(s):** (CHEM 112G or CHEM 116G) and (PHYS 211G or PHYS 215G).

**CHME 568. Intermediate Adsorption****3 Credits**

Introduction to the fundamentals and applications of biofuels and bioenergy produced from biomass; renewable feedstocks, their production, availability and attributes for biofuel/bioenergy production; types of biomass-derived fuels and energy; thermochemical conversion of biomass to heat, power, and fuel; biochemical conversion of biomass to fuel; biodiesel production; environmental impacts of biofuel production; economics and life-cycle analysis of biofuel; value-added processing of biofuel residues; term paper of selected topics relevant to biofuels. Taught with CHME 468.

**Prerequisite(s):** CHME 201.

**CHME 579. Corrosion and Degradation of Materials****3 Credits**

Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstructure on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories. Taught with CHME 479.

**Prerequisite(s):** CHME 361.

**CHME 581. Biomedical Engineering & Healthcare Engineering****3 Credits**

Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. Taught with CHME 481.

**Prerequisite(s):** CHEM 116G, CHME 201.

**CHME 585. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing and applications of biomass materials to fulfill food, feed, fiber, fuel and chemical feedstock needs with energy, water, cost, sustainability, and waste management considerations. Taught with CHME 485.

**Prerequisite(s):** CHEM 211 or 313 or consent of instructor.

**CHME 586. Biofuels****3 Credits**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits. Restricted to: CHME, CH E majors.

**Prerequisite(s):** CHME 201.

**CHME 588. Elements of XRD****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: PHYS 568.

**CHME 589. Modern Materials****3 Credits**

Same as PHYS 489 with differentiated assignments for graduate students. Crosslisted with: PHYS 589.

**Prerequisite(s):** PHYS 455 or PHYS 554.

**CHME 590. Graduate Seminar****1 Credit**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Restricted to: CHME majors.

**CHME 594. Professional Communication in Chemical Engineering****2 Credits**

Connections between interpersonal relationships and the effective communication of information. Strategies for formal and informal written and verbal communication in the context of presentations, interviews, reports and publications. Factors affecting non-verbal communication. Special focus will be given to understanding and adapting to the audience's perspective. 2 credits. Open to chemical engineering graduate students or by permission of instructor. This class will prepare you to communicate technical information effectively within a variety of contexts and to a variety of audiences. Class assignments will be partially based on current student needs such as preparing presentations for professional conferences, giving research progress reports, and writing research manuscripts. Restricted to: CHME majors.

**Prerequisite(s):** CHME graduate student standing.

**CHME 598. Ph.D. Research- Level I****1-9 Credits (1-9)**

Individual investigations either analytical or experimental. May be repeated up to 6 credits.

**CHME 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**CHME 690. Graduate Seminar****1 Credit**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated for a maximum of 8 credits. May be repeated up to 8 credits. Restricted to: CHME majors.

**CHME 698. Ph.D. Research- Level II****1-9 Credits (1-9P)**

Advanced topics for current research. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits. Consent of Instructor required.

**Prerequisite(s):** successful completion of Ph D qualifying exam.

**CHME 700. Doctoral Dissertation****15 Credits (15)**

Individual research in selected topics of current interest in chemical engineering. May be repeated up to 88 credits. Thesis/Dissertation Grading.

**Prerequisite(s):** CHME 698 (9 credits) and successful completion of comprehensive exam.

## CHSS - COMM HEALTH/SOC SRVCS (CHSS)

**CHSS 101. Overview of Health and Community Services****3 Credits**

Health and community service professions with emphasis on public health, community health education, and environmental/occupational health.

**CHSS 216. Ethical and Research Issues in Human and Community****Service****3 Credits**

Ethical and legal responsibilities of health personnel with emphasis on research applications. May not receive credit for both CHSS 216 and CHSS 316. Community Colleges only.

**CHSS 295. Leadership/Mentorship Training for the CHSS Ambassadors Program****1 Credit**

Leadership development for volunteers serving as CHSS ambassadors. Focus on public relations and CHSS undergraduate degree programs. Graded S/U.

**Prerequisite:** consent of instructor.

**CHSS 299. Service Learning Experience in Human and Community Services****3 Credits**

Exploration of contemporary social, civic, economic and ethical problems that require student participation in collaborative efforts within the community. Requires 30 clock hours of community based service for each credit. Graded: S/U. Contact instructor for approval.

**Prerequisite(s):** CHSS 101, HL S 150 and HL S 275 or consent of instructor.

**Corequisite(s):** HL S 295 or CHSS 216.

## CMI - CINEMA & FILM/VIDEO PROD (CMI)

**CMI 100. Introduction to the Creative Media Industry****3 Credits**

This class is an introductory course for students interested in learning about the creative media industry and the Creative Media Institute. It offers a broad view of the entire industry including Marketing, Production, Budgets, Jobs, New Media Literacy, and Industry Standards. Students will listen to experts in the field, and become involved in open discussions about the industry and use new information to complete hands-on assignments in the laboratory. Restricted to Las Cruces campus only.

**CMI 200. Sound Design 1****3 Credits**

Focuses on the techniques for creating, recording and manipulating sounds through challenging sound design projects. Crosslisted with: CMT 206.

**Prerequisite(s)/Corequisite(s):** CMI 235. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 205. Cinematography I****3 Credits**

Theories and techniques of visual design in videography and the aesthetics of lighting. Crosslisted with: CMT 205.

**Prerequisite(s)/Corequisite(s):** CMI 235. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 216. Editing I****3 Credits**

Focuses on individual editing skills including capture, interface, basic cuts, and transitions. Crosslisted with: CMT 195.

**Prerequisite(s)/Corequisite(s):** CMI 235. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 220. Drawing for Animation****3 Credits**

Introductory study of the human and animal form in relation to animation. Students learn fundamentals and exaggeration of the figure, as related to proportion, rhythm, mechanics, and motion. Areas of focus are: basic form, proportion, shape, contour, gesture, anatomy, portraiture, perspective, clothing effects and drawing from observation. Restricted to: CMT,DFM,ANVE majors.

**CMI 228. History of Cinema I****3 Credits**

This course surveys the history of cinema - investigating the process by which the original "cinema of attractions" evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, as well as many key international movements that helped shape it. Restricted to: G-CMI, DFM, ANVE majors.

**CMI 231. History of Animation****3 Credits**

Explores the history of Animation as an art form and industry through readings, screenings, lecture and periodic guest speakers. Restricted to: G-CMI, ANVE, DFM majors. Restricted to Las Cruces campus only.

**CMI 232. Storyboarding****3 Credits**

Examines effective writing principles for creating storyboards that communicate the overall picture of a project. There are timing, scene complexity, emotion and resource requirements. Crosslisted with: ENGL 232. Restricted to: DFM,ANVE, G-CMI majors. Restricted to Las Cruces campus only.

**CMI 233. Light, Shade, Render****3 Credits**

This course will explore the theory and practice of 3D lighting and rendering methodologies. Techniques covered will implement cameras, lighting sources, textures, surface-mapping and algorithmic rendering to produce stylized and photo realistic images. Topics covered will include direct and indirect lighting, shaders that simulate physical substances and effects, rendering multiple passes and simulating physical lens effects. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** CMI 260, CMI 280, or Consent of Instructor.

**CMI 235. Narrative: Principles of Story Across the Media****3 Credits**

Examines the various strategies of written and visual storytelling: narrative structure and its principle components (plot, theme, character, imagery, symbolism, point of view), with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc. Crosslisted with: ENGL 235. Restricted to: G-CMI, DFM, ANVE majors. Restricted to Las Cruces campus only.

**CMI 240. Digital Illustration****3 Credits**

Introductory course examining traditional artistic expressions and translating visual art experiences into a digital art medium to enhance visual storytelling. Students acquire basic principles of drawing and painting through hands-on experience manipulating tonal value, composition, form development, light and shadow, color theory, rendering realism, and graphic design. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 245. 2-D Compositing & FX****3 Credits**

The purpose of this course is to familiarize students with the powerful compositing and special effects tools of Adobe After Effects for 2D, traditional animation. Students will learn how to assemble an existing un-rendered animation into a final piece with advanced 3D lighting, spacing, and digital effects so that it can achieve a dynamic, professionally rendered look. Restricted to Las Cruces campus only.

**CMI 250. Beginning 2-D Animation****3 Credits**

Learn the basics of digital 2D animation by creating an animated short from a storyboarded scene using professional animation, imaging, and editing software. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**CMI 260. Foundations of 3D Animation****3 Credits**

The objective of this course is to provide a hands-on overview of the 3D animation production process. Students will be introduced to basic story development and the creation of computer generated assets and cinematic sequences. The course will survey specialty areas of digital animation and various software and techniques applied in entertainment and information media. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** CMI 235, CMI 232 or consent of instructor.

**CMI 270. Rigging for 3D Animation****3 Credits**

This course will introduce principles and practices of current 3D animation rigging. Students will develop fundamental methods necessary to create character rigs. Students will learn aesthetic, technical, and optimization concepts as they apply to organic and mechanical designs. Topics will include: hierarchies, constraints, deformation rigging, skeleton creation, skinning, forward and inverse kinematics, controls, body and facial rigging. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** CMI 260.

**CMI 280. Modeling****3 Credits**

This course will introduce 3D modeling methods and current practices. Students will learn preliminary and detailed modeling techniques using industry standard software. Methods will emphasize formal and functional aspects of modeling as they apply to mechanical, organic, and sculpted topology for application in animation, games, and information media. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

**CMI 290. 3-D Animation****3 Credits**

Overview of the essentials and principles of 3D animation; creative methods for using industry standard tools to produce the illusion of movement for storytelling. Topics include, keyframe and curve animation, kinematics, cycle animation, camera animation, deformers, and constraints.

**Prerequisite(s):** CMI 260, CMI 250 or consent of instructor.

**CMI 300. History of Cinema II****3 Credits**

An advanced, in-depth analysis of cinema's history. Course may focus on one specific area of cinema history depending on instructor.

**Prerequisite(s)/Corequisite(s):** CMI 235, CMI 228. Restricted to: DFM, ANVE, G-CMI majors. Restricted to Las Cruces campus only.

**CMI 301. Sound Design II****3 Credits**

Mixing and balancing dialogue, sound effects and music in postproduction. Study the role of sound effects, foley, soundtrack choices, and music supervision. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 200.

**CMI 303. Cinema Review and Critique****3 Credits**

This course is for the student who wants to learn to be a more active, intelligent film viewer. It encourages critical thinking about films and educates students on how to write a film review. Students will meet in the movie theater to watch essential films that serious movie watchers should see from classic motion pictures, to current release major motion pictures, independent films and world cinema features. The course will serve as a guide to the illuminating process of evaluating, analyzing, and reviewing movies. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 235.

**CMI 305. Business of Filmmaking/Animation****3 Credits**

Explores the roles of unions, basic contracts, legal arrangements, and the economics of the production process, distribution, and financing. Consent of Instructor required.

**Prerequisite(s):** CMI 235.

**CMI 308. Writing for Animation****3 Credits**

This class explores methods for, and approaches to, writing for animation. Students study and produce scripts for a range of animation outlets while engaging in writing exercises based on character and story development.

**Prerequisite(s):** CMI 235 or consent of instructor.

**CMI 309. Screenwriting I****3 Credits**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Crosslisted with: ENGL 309 and THTR 306.

**Prerequisite(s):** ENGL/CMI 235 or consent of instructor.

**CMI 310. Cinematography II****3 Credits**

Advanced tools of the cinematographer, lighting and composition techniques. Artistic and technological elements of cinematography.

Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 205, CMT 205.

**CMI 311. Editing II****3 Credits**

Advanced techniques in digital films using professional non-linear editing systems. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 216.

**CMI 314. Acting for Film****3 Credits**

Techniques for film and television acting. In-depth analysis of film performance creation among actor, director, writer, cinematographer, and editor. Restricted to: THTR, DFM majors.

**Prerequisite(s):** CMI 235.

**CMI 315. Adventures in Genre****3 Credits**

Students learn storytelling strategies for the screen by studying various structural genres and components of screenplays and films. Utilizing these strategies, students develop a number of their own original screenplay ideas. Additionally, pitch workshops are held and students learn to present their ideas in various, practical situations.

**Prerequisite(s):** CMI 235 and CMI 309.

**CMI 316. Border Cinema Around the World****3 Credits**

What is the relationship between borders, identity, and vulnerability - and how is this relationship explored in cinema? How are borderlands also testing grounds - the sites of serious ethical dilemmas? By examining powerful feature films from such regions as the Middle East, the Balkans, and the US/Mexico border, we will explore ways in which personal, familial, communal, and national identities are defined through the complex process of bordering. We will investigate the role of cinema in reflecting and/or facilitating this process.

**CMI 318. Documentary Production****3 Credits**

Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 216, CMI 205.

**CMI 320. Race and Gender in Film****3 Credits**

In this course students will analyze film as an art form as well as be exposed to Race and Gender Feminist Film Theory. We will consider the role of film in our understandings of sex, gender and sexuality. Through discussions and writing we will work to discern relevant social, political, ideological, and aesthetic concepts in the media we examine. Crosslisted with: ENGL 399, W S 450 and W S 550.

**CMI 321. Las Cruces International Film Festival Production****3 Credits**

This course is designed to enhance student knowledge about film festivals and the Las Cruces International Film Festival. From soup to nuts, students will learn how to manage and execute a major film festival, including film solicitation and submissions, festival event marketing, celebrity appearances, industry workshops, filmmaker coordination and brand management. Students will gain an appreciation of the value of a film festival to the community and for visiting filmmakers. Students will apply this knowledge in their written assignments, film evaluations, and departmental responsibilities. Each student will help program a festival category and co-manage one of the critical elements of the festival. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 235.

**CMI 328. Producing****3 Credits**

Examines the role of the Producer, essential to every film production. The course will revolve around the best practices in organizational design, the production process, the budgeting process, financial controls, scheduling, insurance and distribution.

**Prerequisite(s)/Corequisite(s):** CMI 200, 216, 235. Restricted to: ANVE,DFM majors.

**CMI 329. Studies in Drama****3 Credits**

Students will draw on a group of related American and European dramatic works to examine various areas of 20th century culture. Topics will vary. Restricted to DFM, ANVE, ENGL, THTR majors. Crosslisted with: ENGL 329 and THTR 329

**CMI 330. Developing the Animated Project****3 Credits**

This course will cover fundamental theories and elements of the production and development processes for animated projects. Concept, story, and story and character development will be addressed as well as storyboarding, layout, sound, voice recording and basic editing. Students will develop at least one animated project, and construct an animatic to be used for future production. Restricted to: ANVE, DFM majors.

**CMI 332. 3-D Character Animation****3 Credits**

Essentials and principles of 3D character animation. Techniques and craft of breathing life into characters through movement, including dynamic poses, blocking action, run and walk cycles, lip synching and realism. THTR 110, Acting and CMI 200, Sound Design are recommended. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** THTR 105 (or CMI 314 or CMI 348), CMI 260 and CMI 290 or consent of instructor.

**CMI 341. Visual Effects I****3 Credits**

Fundamentals and principles of live action footage and computer generated imagery integration, including 3D animation, matchmoving, green screen setup, keying and compositing. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 205, CMI 260, 280 (or consent of instructor).

**CMI 348. Acting for Animation****3 Credits**

This course explores performance techniques relevant to animators including 2D and 3D animation and motion capture. Students learn to create dynamic, dramatic performances and believable character interactions. Students learn to analyze scripts, sound, acting, action and performance for production. Topics include: acting theory, emotional/ mental states, character movement and style, dynamic facial expression, scene construction, posing, layering and rhythm, simplification and exaggeration, and voice-over. May be repeated up to 3 credits. Restricted to: DFM,ANVE majors.

**CMI 350. Intermediate 2-D Animation****3 Credits**

Learn the more refined aspects of motion for character animation by focusing on Disney's 12 Principles of Animation, practicing these advanced drawing techniques in exercises and incorporating them into a brief final short.

**Prerequisite(s):** CMI 250.

**CMI 360. Previsualization****3 Credits**

Implements 3D animation tools in preproduction shot and sequence design for motion picture and broadcast industries; including 3D storyboarding, technical planning and editing basics. LC Campus Only.

**Prerequisite(s):** CMI 260, CMI 280, and CMI 290 or consent of instructor. Restricted to ANVE, DFM majors.

**CMI 362. Motion Graphics****3 Credits**

Students will learn the basics of Motion Graphics by working through a variety of exercises and a final project that will combine animation, text, visual effects, and sound using Adobe After Effects, Photoshop, and Illustrator. Restricted to: ANVE, DFM majors.

**CMI 365. Character Design and Development****3 Credits**

Digital character design for the entertainment industry. Provides insight into the process of creating iconic characters. Traditional and contemporary character designers are explored. Industry workflow is introduced and necessary skills are developed to design detailed 3D characters from concept through production.

**Prerequisite(s):** CMI 250, CMI 260 and CMI 280, or consent of instructor. Restricted to ANVE, DFM majors.

**CMI 377. Game Design Workshop****3 Credits**

In this course we will learn to design, develop, and playtest games. This approach will be exercise driven and involve nontechnical approaches as well as digital production techniques. This playcentric approach will involve player participation from conception through production. We will explore the iterative processes of prototyping, playtesting, and revising based based on feedback. Consent of Instructor required. Restricted to: ANVE, DFM majors.

**CMI 395. Directing I****3 Credits**

Study and application through short scene work of the basic tools of a director and relationships with actors, designers, playwright, and stage managers. Interpreting as well as organizing. May be repeated up to 3 credits. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** CMI 200, AND CMI 205, AND CMI 216.

**CMI 396. Directing II****3 Credits**

Addresses pre-production concerns including script breakdown, casting ground plans and coverage. The criteria employed when selecting the creative team including a director of photography, art director, light, sound and wardrobe designers. Introduction to budgeting, scheduling, and script breakdowns. Prerequisite: CMI 395

**CMI 397. Practicum****1-3 Credits (1-3)**

Practical application of the student's field of study in a project environment. May be repeated up to 9 credits. Consent of Instructor required.

**CMI 398. Special Topics****3 Credits**

This course addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. May be repeated up to 12 credits.

**CMI 400. Directed Studies****1-6 Credits (1-6)**

Directed study course in CMI under the supervision of a CMI faculty member. May be repeated up to 9 credits.

**CMI 401. Motion Capture Techniques****3 Credits**

Implement industry standard motion capture techniques to capture and integrate performance for movie making, 3D animation and game production. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 260, CMI 290 and CMI 270 (or consent of instructor).

**CMI 410. Cinematography III****3 Credits**

This class is geared towards those who want to learn more about cinematography, color grading, and digital technology as it pertains to cinematography. Shooting high-end codecs (ProRes/DNxHD) or RAW are becoming more and more popular in filmmaking as camera manufactures and computer processing get better. This class will be a mix of production and post-production as learning how to shoot these higher end codecs do not end with the camera. Focus will be on techniques of shooting raw, understanding how to operate a camera capable of high end image acquisition, properly building up the camera rig and accessories, managing data and the post-production workflow. Consent of Instructor required. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 310.

**CMI 412. Advanced Equipment Training****3 Credits**

This class is designed for students who want to dive deep into building and operating much of our advanced camera and G&E equipment.

Though these on-set tasks are performed by below-the-line crew members, having the knowledge of and ability to use this equipment will serve you greatly as a DP. We will go over a wide variety of devices in this class, ranging from car mounts and our GlideCam to our large jib, 3-axis gimbal, 500-amp generator, and 6K HMI lights. We will also do some advanced lighting scenarios. The goal of this class is to get you "certified" on all the above items, resulting in your being able to build this equipment for other CMI sets, such as the Mixed Class Productions, Senior Projects, etc. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 310.

**CMI 420. Short Film Production****3 Credits**

Students work in teams with rotating crews to write, produce, direct and edit individual and group projects-ultimately demonstrating growing confidence with production equipment and professional practices. May be taken up to 6 credits. Consent of instructor required. Pre/

**Prerequisite(s):** CMI 200, CMI 216, CMI 205, CMI 235, CMI 309 and CMI 395.

**Corequisite(s):** CMI 328.Restricted to ANVE, DFM majors.

**CMI 421. Short Film Post-Production****3 Credits**

Students work together to complete short films shot in CMI 420. This course focuses on advanced post-production techniques, including editing and sound design, as student directors, editors and producers continue to learn to work together. In the last half of the course, students will build marketing campaigns and submit their finished film to festivals. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

**Prerequisite(s):** CMI 420.

**CMI 433. Sets and Environments****3 Credits**

Digital environment design and creation for movies and games from concept to production; including illustration, modeling, matte painting, texturing, lighting, rendering, integration, and camera projection. May be repeated up to 3 credits. Restricted to: DFM,ANVE majors.

**Prerequisite(s):** CMI 260, CMI 280, and CMI 233 or consent of instructor.

**CMI 450. Advanced 2-D Animation****3 Credits**

Advanced techniques in two dimensional animation including motion graphics and integration of live action. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 350.

**CMI 470. Short 2-D Animation Production****3 Credits**

This is a full-scale animation production class where students will be divided into teams according to the animation skills they have demonstrated in the beginning, intermediate, and advanced classes. Each team member will specialize in one important facet of the production process: character animation, background painting, technical direction, coloring, or story development and storyboarding. 4 to 8 minute animated shorts will be produced. Restricted to: ANVE,DFM majors.

**Prerequisite(s):** CMI 450, CMI 361.

**CMI 477. Digital Game Design****3 Credits**

This course covers the theory and practice of digital game production using industry standard media and game engine applications. Students apply animation and game development approaches toward gameengine constraints and requirements to create gameplay experiences. Design and production methods are implemented to create game levels and populate them with original assets. Team based game prototyping will require multiple disciplines to devise unique digital game experiences. Consent of Instructor required. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 377.

**CMI 480. Screenwriting II****3 Credits**

Students will write 2 short scripts, 10-15 pages each throughout the semester. Focus will be on learning how to take notes and rewrite. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Crosslisted with: ENGL 480

**Prerequisite(s):** ENGL 309 or CMI 309 or THTR 306 or consent of instructor. Restricted to ENGL, DFM, ANVE majors.

**CMI 490. Advanced Screenwriting****3 Credits**

Students will prepare a 30-60 page screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. This course is aimed at preparing writers for the professional market. Consent of instructor required. Restricted to ENGL, DFM, ANVE majors. Crosslisted with: ENGL 491

**CMI 491. 3D Production Studio I****6 Credits**

The course is the first semester of a year-long effort to complete a Senior Project. The project will be narrative-driven short form, 3D animation or visual effects movie. Emphasis will be on pre-production and some production depending on ongoing CMI productions. You will produce a professional quality product with the aim to assist you in gaining entry into professional employment or graduate school. The course may be adapted toward a specific concentration in animation, visual effects, or digital film making, for group and individual productions. Each project must be approved by the Instructor and work within departmental policies and procedures.

**Prerequisite(s)/Corequisite(s):** CMI 332, CMI 360, CMI 365, CMI 433.

**Prerequisite(s):** CMI 308. Restricted to: ANVE majors.

**CMI 492. 2D Production Studio I****6 Credits**

In CMI 498, Pre-Production, students will write a script, create a storyboard, record voice over and/or dialogue and time these storyboards to this dialogue/voice over creating an Animatic. For those doing demo reels, students will start to compile exercises from all of all their prior classes. Additional exercises will then be assigned to augment the skill set of the student according to the needs of each student. Restricted to: ANVE majors.

**Prerequisite(s):** CMI 350, CMI 361.

**CMI 493. 3D Production Studio II****6 Credits**

The course is the final semester of a year-long concentration on your Senior Project. Emphasis will be on the production, post-production, and distribution of the work created in the first semester. You will produce a professional quality product that will help you gain entry into professional employment or graduate school. The overall objective is that you will demonstrate mastery of craft through synthesis of concept and technique, resulting in an original cinematic experience. Restricted to: ANVE majors.

**Prerequisite(s):** CMI 491.

**CMI 494. 2D Production Studio II****6 Credits**

Students will complete an entire animated short, trailer, or demo reel for their portfolios by the end of Senior Project II. In CMI 494, Production and Post-Production, students will animate their stories according to the layout set in the animatic from Senior Project I. Lastly, they will composite and edit their shorts into a final piece that will be viewable in time for the Senior Showcase. For demo reels, students will continue to hone their reel into a finished piece that can be presented at the Senior showcase. Restricted to: ANVE majors.

**Prerequisite(s):** CMI 492.

**CMI 495. Internship****1-12 Credits (1-12)**

Placement in a production facility and supervised experience required. With CMI advisor approval only. May be repeated up to 18 credits. Consent of Instructor required. Restricted to: DFM, ANVE majors.

**CMI 496. Media Law/Ethics****3 Credits**

Overview of legal & ethical issues in creative media elements of business and commercial law. This class will focus on the fundamentals of entertainment law by exploring the business and legal relationships within film industries, and animation. Learn to anticipate and avoid legal problems prior to production. Key issues in the area of copyright law, sources of financing, distribution agreements; insurance and union consideration will be discussed. Restricted to ANVE, DFM majors.

**CMI 497. Portfolio Design and Development****3 Credits**

Advanced graphic design projects with an emphasis on conceptual development, portfolio preparation, and professional practices. Refine general marketing strategies, personal portfolio, and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional/demo packages. Restricted to: DFM, ANVE majors.

**CMI 498. Final Year Senior Project I: Production and Post Production****3-6 Credits (3-6)**

Senior Project I is the first half of a year long concentration on a pre-approved creative project guided by a faculty member. Projects are narrative-driven and have an end product: screen-play, short film, documentary, 2-D or 3-D animated short, or pilot with treatment for television. Consent of Instructor required. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** Consent of instructor.

**CMI 499. Final Year Senior Project II: Production and Post Production****3-6 Credits (3-6)**

Senior Project II is the second half of a year long concentration on a pre-approved project, guided by a faculty member. Projects are narrative driven and have an end product: short film, documentary, 2-D or 3-D animated short, or pilot and treatment for television. May be repeated up to 9 credits. Restricted to: ANVE, DFM majors.

**Prerequisite(s):** CMI 498 and Consent of Instructor.

## CMT-CREATIVE MEDIA TECHNOLOGY (CMT)

**CMT 100. Introduction to Visual Communications****3 Credits**

Overview of the process of crafting a digital product from conception to final. Incorporates basic principles of art and design, typography, layout, color and imagery, logos and advertising basics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**CMT 108. Introduction to Media Technologies****1-3 Credits (1-3)**

Introduction to various media technologies. May be repeated up to 12 credits. Restricted to Community Colleges campuses only.

**CMT 110. Introduction to Web Design****1 Credit**

Basics of creating simple web sites for personal use.

**CMT 115. Digital Photography and Imaging I****3 Credits (2+2P)**

Principles and techniques of photography using digital equipment with an emphasis on lighting, focus, and composition.

**CMT 120. Introduction to Creative Media****3 Credits (2+2P)**

Exploration and discovery of the creative processes through art, music, theater, narrative, and other avenues.

**CMT 126. Film Crew Training I****9 Credits**

This course was designed in collaboration with the NM IATSE Local 480 union and the NM Film Office and focuses on providing hands-on training for students wishing to work on film crews. The course will offer an overview of the primary below-the-line craft areas of film production. Restricted to: Community Colleges only.

**CMT 130. Introduction to Web Design****3 Credits (2+2P)**

Introduction to web development techniques, theory, and design. Incorporates HTML and industry-standard web editing software in developing various web sites. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** ART 161 OR CMT 145.

**CMT 135. Introduction to 3D Computer Animation****3 Credits (2+4P)**

Learning to work in a 3D environment. Introduction to the basics of modeling, animation, dynamics, and rendering. Working with polygons, NURBS and subdivisions, and editing in multiple interfaces. May be repeated for a maximum of 6 credits.

**CMT 140. Print Media I****3 Credits (2+2P)**

Creation and design of publications and presentation materials using page layout software. May be repeated for a maximum of 6 credits.

**CMT 142. Computer Illustration****3 Credits (2+2P)**

Preparation of digital graphics with a vector or draw program for use in print, web, video, animations, and multimedia. May be repeated for a maximum of 6 credits.

**CMT 145. Image Processing I****3 Credits (2+2P)**

Design and creation of digital graphics using a raster or bitmap program for use in print, multimedia, video, animation and web. May be repeated for a maximum of 6 credits.

**CMT 150. 2D Animation****3 Credits (2+2P)**

Concepts and techniques in storyboarding and creating interactive 2D animations for web, multimedia and video.

**Prerequisites:** CMT 142.

**CMT 151. Evolution of Electronic Games****3 Credits (2+2P)**

Focus on the evolution of video games and how they have shaped mainstream entertainment. May be repeated up to 6 credits.

**CMT 155. Selected Topics****1-4 Credits (1-4)**

Specific titles to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits. May be repeated up to 18 credits. Restricted to Community Colleges campuses only.

**CMT 156. Film Crew Training II****9 Credits**

The purpose of this course is to provide applied training in a specific film production crew craft area, in which a student has decided to specialize. The various craft areas include but are not limited to, Art Dept., Grip, Electric, Sound, Production Office, Script Supervision, Props, Set Dressing, Locations, Special Effects, Hair/Makeup, Wardrobe, Production Assistant/Set Operations. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 126.

**CMT 160. Modeling and Animation****3 Credits (2+2P)**

Building on student's knowledge of 2D animation, covers modeling, animating objects and scenes in a 3D environment using various camera and lighting effects. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.

**CMT 165. Writing and Storyboarding****3 Credits (2+2P)**

Learning good writing principles to create storyboards and scripts that communicate the overall picture of the project, timing, scene complexity, emotion, and resource requirements.

**Prerequisite:** CMT 135 or CMT 160.

**CMT 170. History of Film: A Global Perspective****3 Credits**

Explores the history of cinema from the earliest 19th century developments to the present digital video revolution. Offers students a broader base of understanding of the tools and methodologies used in the craft.

**CMT 175. 3-D Character Design****3 Credits (2+4P)**

Focus on designing a character and then taking that design and building it in 3D using intermediate modeling techniques. May be repeated for a maximum of 6 credits.

**Prerequisite:** CMT 135 or CMT 160.

**CMT 180. Design Principles****3 Credits (2+2P)**

Techniques and theories of design principles, including layout foundations, logo building, type, color, and story-boarding and their application to print, web, animation and video. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 142 or CMT 146.

**CMT 182. Environmental Modeling, Shading and Lighting****3 Credits (2+4P)**

Modeling design techniques to create natural and architectural environments to be used for animated films and gaming. Study of various lighting techniques, shading and shadowing.

**Prerequisite:** CMT 135 or CMT 160.

**CMT 185. 3D Shading and Lighting Techniques****3 Credits (2+4P)**

Study of various global, scene and character lighting techniques, shading and shadowing, and creating atmospheres and reflections that bring computer generated 3D scenes to life. Examines environmental and studio lighting to bring real life experience into the digital production process.

**Prerequisite(s):** CMT 135 or CMT 160.

**CMT 190. Digital Video Production I****3 Credits (2+4P)**

A hands-on study of the tools and techniques used to produce the independent video. Through the production of various short projects, the student explores how the ideas of the writer/director are translated into a visual story. May be repeated for a maximum of 6 credits.

**CMT 195. Digital Video Editing I****3 Credits (2+2P)**

A study of the basic tools and techniques of non-linear digital video editing. May be repeated for a maximum of 6 credits.

**CMT 200. Critical Game Studies****3 Credits (2+2P)**

Focus on creating a complete design document utilizing techniques and standards used in the industry today. May be repeated for up to 6 credits. Restricted to: Community Colleges only.

**CMT 205. Cinematography****3 Credits (2+2P)**

Theory and techniques of visual design in cinematography and the aesthetics of lighting. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 190.

**CMT 206. Principles of Sound****3 Credits (2+2P)**

Study of soundtrack design theory, and the use of audio editing software that is compatible with media editing software to create soundtracks for different visual media. Pre/ Restricted to: Community Colleges only.

**Corequisite(s):** CMT 195.

**CMT 210. Digital Video Production II****3 Credits (2+2P)**

Advanced techniques of the tools and application of professional film making. May be repeated for a maximum of 6 credits.

**Prerequisite:** CMT 190.

**CMT 215. Digital Video Editing II****3 Credits (2+2P)**

Advanced features of digital video, audio/music, and titling production software. Included are color correction, vector scopes, motion effects, and advanced editing techniques used by filmmakers. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 195.

**CMT 216. Digital Photography and Imaging II****3 Credits (2+2P)**

Provide understanding and skills needed for advanced digital capture, editing, optimizing and manipulating photographic images for print, web and multimedia applications. The course will prepare students to make more advanced technical and more refined aesthetic decisions relative to specific photographic applications. Restricted to: Alamogordo campus, Carlsbad campus, Dona Ana campus.

**Prerequisite(s):** CMT 115.

**CMT 217. Layer Animation & 3D Applications in Photoshop****1 Credit**

This is an advanced course in Photoshop 2D techniques and motion graphic applications pertaining to the animation of Photoshop Layers juxtaposed over time and space relationships. Restricted to: CMT majors. Restricted to Community Colleges only.

**Prerequisite(s):** CMT 145.

**CMT 218. Video for Social Interaction and Informal Commerce****3 Credits**

The use of DSLR video has opened the way for photographers to be able to add video as a component of expression. This course shows the ways that this tool can be used for on-line instructional videos, demonstrations and presentations. As more and more commercial entities become involved in YouTube and other social media, this becomes a vocationally viable form of visual communication. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Community Colleges only.

**CMT 220. Environmental Scene Design****3 Credits (2+4P)**

Modeling design techniques used to create environments and scenes for use in animated films and games. Investigation of both natural and architectural environments to be recreated in the virtual world.

**Prerequisite:** CMT 135 or CMT 160.

**CMT 221. Internship****1-3 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 9 credits. Consent of Instructor required. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**Prerequisite(s):** Consent of instructor.

**CMT 222. Pre-production Management****3 Credits (2+2P)**

Pre-production planning paperwork breakdowns, budgeting, and scheduling; taking a project from start to finish from a producers standpoint.

**Prerequisite:** CMT 190.

**CMT 223. Media Production Services****1-3 Credits**

A design studio environment in which students obtain real-world experience while providing service to college and non-profit associations with faculty supervision using a variety of media. Can be used with permission to fulfill cooperative requirement. May be repeated for a maximum of 6 credits.

**Prerequisite:** CMT 180 or ART 163.

**CMT 224. Environmental Scene Design II****3 Credits**

Second level of modeling design techniques used to create environments and scenes for use in animated films and games. Investigation of both natural and architectural environments to be recreated in the virtual world. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 220.

**CMT 225. Anatomical Character Design****3 Credits (2+4P)**

Focus on building anatomy-based 3D characters. Advanced study in NURBS, subdivisions, and polygon modeling techniques used to create fully functional and realist models. May be repeated for a maximum of 6 credits.

**Prerequisite(s):** CMT 175.

**CMT 226. Film Crew Cooperative Experience****3-6 Credits (3-6)**

Industry production experience in specific craft areas for film crew technicians who have successfully completed two semesters of FTTP. Restricted to: Dona Ana campus, Carlsbad campus.

**Prerequisite(s):** CMT 156.

**CMT 227. Advanced Character Animation****3 Credits (2+2P)**

Focus on complex rigging techniques as well as utilizing advanced animation functions to blend multiple animations into complex animations. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 160.

**CMT 228. Level Design Concepts****3 Credits (2+2P)**

Focus on the design and creation of video game levels. Dealing with the challenges and pitfalls of different video game genres. May be repeated for a maximum of 6 credits. Prerequisite: CMT 200

**CMT 229. 3D Digital Sculpting****3 Credits**

Introduce students to the 3D Sculpting programs which are the industry standard sculpting programs. Students will learn how to create complex high polygon sculpts and normal maps and transfer the models into 3D studio Max and Autodesk Maya. May be repeated up to 6 credits. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 160.

**CMT 230. Web Design II****3 Credits (2+2P)**

Creating and managing well-designed, organized web sites using HTML and web development software. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 130.

**CMT 235. Web Design for Small Businesses****3 Credits (2+2P)**

Technology and techniques for designing and building a web presence for small business. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 130.

**CMT 236. Digital Audio Fundamentals****3 Credits (2+2P)**

Advanced digital audio post production and recording techniques using current entertainment industry-standard software and hardware. Restricted to: Community Colleges only.

**CMT 240. Print Media II****3 Credits (2+2P)**

Refining of technical design skills using advanced features of page layout software in preparing a variety of business-related documents. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 140.

**CMT 242. Advanced Computer Illustration****3 Credits (2+2P)**

Advanced techniques in 2D vector drawing and fundamentals of 3D illustration for use in print, web, and multimedia applications. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 142.

**CMT 245. Image Processing II****3 Credits (2+2P)**

Advanced techniques in editing and manipulation of raster images for digital graphics for print, multimedia and web. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 145.

**CMT 247. Production Audio****3 Credits (2+2P)**

Essential tools and techniques in: field and studio recording and mixing, environmental assessment, film set protocol, various microphones, audio documentation, wildlines, ambient audio. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 190 and CMT 236.

**CMT 248. Music Production and Mastering****3 Credits (2+2P)**

Introduction to fundamental tools and techniques in music production and mastering. Including: microphones and microphone techniques, live and studio recording, editing, mixing, and introduction to mastering digital audio. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 206 and CMT 236.

**CMT 249. Layer Animation and 3D Applications in Photoshop****3 Credits**

This is an advanced course in Photoshop 3D techniques and motion graphic applications pertaining to the animation of Photoshop Layers juxtaposed over time and space relationships. May be repeated up to 6 credits. Restricted to Community Colleges only.

**Prerequisite(s):** CMT 245.

**CMT 251. Gaming Platform and Standards****3 Credits (2+2P)**

Focus on the different gaming platforms and their corresponding gaming demographics and standards. May be repeated up to 6 credits. Restricted to: CMT majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 200.

**CMT 252. Game Tools and Techniques****3 Credits (2+2P)**

Focus on the different engines and gaming technologies that power the games of today. May be repeated for a maximum of 6 credits.

**Prerequisite:** CMT 200.

**CMT 254. History of Media Design****3 Credits**

An introduction to the principles of design history and theory within a chronological framework of historical and emerging media.

**CMT 255. Special Topics****1-4 Credits**

Specific topics to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

**CMT 256. Typography****3 Credits**

Foundation in typography with an emphasis on history of typography and the practical application and impact of font choices for print, web, animation and video. Deals with studies in font or letter construction and font choices focusing on design, application, incorporation, and visual impact. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 142.

**CMT 258. Advanced Camera Techniques****3 Credits (2+2P)**

Professional camera techniques and training for electronic news gathering and studio filmmaking. Utilizes high-end handheld shooting techniques, cranes, dollies, and steadicam training. May be repeated for a maximum of 6 credits.

**Prerequisite:** CMT 190.

**CMT 260. 3D Special Effects****3 Credits (2+4P)**

Creating advanced virtual special effects for both rigid and soft bodies. Using MEL, dynamic principles, mixing nodes, and advanced particle systems. How to drive particles over surfaces, add texture to flow, create surface tensions, and use collision events to drive texture. Study of integrating computer-generated images with real-life video and audio.

**Prerequisite:** CMT 160 or CMT 225.

**CMT 265. Personal Character Development****3 Credits (2+4P)**

Focus on the development of personal character(s), from sketch to render. Develop complete biographies of character, then build, skin and animate with as many personal attributes as possible.

**Prerequisite:** CMT 225.

**CMT 275. Advanced Web Techniques****3 Credits (2+2P)**

Creating and managing complex web sites using advanced techniques and tools. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.

**Prerequisites:** CMT 145 and CMT 230.

**CMT 276. Advanced Photography Workshops****1 Credit**

This is a series of 1-credit workshops offering specialized and intense advanced skill training and upgrading applications of photography for commercial purposes and training in photographic skills and styles presented by a variety of professional lecturers. May be repeated up to 7 credits. Restricted to Community Colleges only.

**Prerequisite(s):** CMT 115.

**CMT 285. Print Media III****3 Credits (2+2P)**

Refinement of skills needed to prepare a variety of documents for print and the service bureau. May be repeated for a maximum of 6 credits.

**Prerequisite:** CMT 140 or CMT 240.

**CMT 290. Advanced 3d Animation Workshop A****3 Credits (2+4P)**

Program capstone. Students will utilize the skills learned in the program to produce their final animation. Group integrated projects are strongly recommended to emulate a real-work animation studio environment. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**Corequisite:** CMT 291.

**CMT 291. Advanced 3d Animation Workshop B****3 Credits (2+4P)**

Program capstone. Students will utilize the skills learned in the program to produce their final animation. Group integrated projects are strongly recommended to emulate a real-work animation studio environment. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**Corequisite:** CMT 290.

**CMT 292. Creative Media Studio****3 Credits (2+2P)**

A studio environment where students specialize in creating film-festival quality and portfolio-ready projects under the supervision of faculty. May be repeated for a maximum of 6 credits.

**Prerequisites:** CMT 190 and CMT 195 or CMT 160.

**CMT 294. Creative Media Studio II****3 Credits**

Second level of studio environment where students specialize in creating film-festival quality and portfolio ready projects under the supervision of faculty. Restricted to Community Colleges campuses only.

**Prerequisite(s):** CMT 292.

**CMT 295. Professional Portfolio Design and Development****1-3 Credits**

Personalized design and creation of the student's professional portfolio including hard-copy, demo reel, and online. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Consent of instructor.

**CMT 298. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of department head. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Minimum GPA of 3.0 and sophomore standing.

## COLL-COLLEGE (COLL)

**COLL 101. College/Life Success****1-3 Credits**

Provides students with an opportunity to cultivate the skills, values, and attitudes necessary to become confident, capable students, and contributing community members. Topics include time management, memory techniques, relationships, health issues, money management, and college and community resources.

**COLL 103. Managing Your Money****1 Credit**

Principles and strategies for effective money management. Includes financial goal setting, both short and long term. Explores the relationship between career and income earning potential. Explores issues of credit and debt management and prevention of identity theft.

**COLL 108. Academic Reading and Study Skills****1-4 Credits**

Introduction to and practice with strategies for effective reading and studying at the college level. Provides laboratory.

**COLL 111. Academic Skills for Mathematics****1-3 Credits (1-3)**

Emphasis on study skills for success in math, up to the calculus level, tailored to meet individual student needs. Topics include test preparation strategies, efficient time management and practice methods, and introduction to and practice with learning software. Consent of instructor required.

**COLL 120. Career Exploration****1 Credit**

Survey of careers possible with community college associate degrees. Information on how to make a career choice.

**COLL 155. Special Topics****1-4 Credits**

Covers specific study skills and critical thinking topics. Specific sub-titles to be listed in the Schedule of Classes. May be repeated for a maximum of 8 credits.

**COLL 201. Critical Thinking Skills****3 Credits**

Introduction to critical thinking processes. Develops higher order thinking necessary to evaluate clearly, logically, and accurately one's academic and life experiences. Practical emphases on assertive thinking and perspectives.

**Prerequisite:** placement scores for CCDE 110 N or higher.

## COMM-COMMUNICATION (COMM)

**COMM 250. Introduction to the Communication Major****1 Credit**

This is a one-credit course for new Communication Studies majors. It helps them get acquainted with the department, the department head (professor for this course, the professors, other students, and the department student organizations. It also deals with degree mapping and career mapping and any problems the students are having in their first year. Finally, the students learn about the the Communication Studies discipline and various communication careers they can pursue with their degree. The class meets one day each week for one hour. Restricted to: Communication Studies majors. Restricted to Las Cruces campus only.

**COMM 253G. Public Speaking****3 Credits**

Principles of effective public speaking, with emphasis on preparing and delivering well-organized, logical, and persuasive arguments adapted to different audiences.

**COMM 265G. Principles of Human Communication****3 Credits**

Study and practice of interpersonal, small group, and presentational skills essential to effective social, business, and professional interaction.

**COMM 285. Survey of Communication Theory****3 Credits**

Exploration of major theories, concepts and methods of research in the study of human communication. Primarily for majors.

**COMM 290. Independent Study****1-3 Credits**

Individualized, self-paced projects for students with a special interest in communication topics. May be repeated for a maximum of 6 credits.

**Prerequisites:** COMM 265G and sophomore standing.

**COMM 291. Special Topics****1-3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**COMM 305. Communication Research Methods****3 Credits**

Introductory course in communication research. Emphasis on how to be an effective consumer of research.

**COMM 351. Persuasion Theory and Practice****3 Credits**

Training in understanding and applying the principles and techniques of argumentation and persuasion.

**COMM 370. Organizational Communication****3 Credits**

Communication strategies and patterns of private and governmental organizations, including research on the communication process.

**COMM 376. Communication and Culture****3 Credits**

Cultural and intercultural communication theory and behavior, with a concentration on the development of specific communication skills which should facilitate effective intercultural communication.

**COMM 377. Conflict Management****3 Credits**

Communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings.

**COMM 384. Interpersonal Communication****3 Credits**

Theories of interpersonal communication and relational communication including study of relevant models, contexts and constructs.

**COMM 425. Small Group Communication****3 Credits**

Principles and methods of modern group discussion with emphasis on the role of the group in problem solving.

**COMM 440. Political Communication****3 Credits**

Presidential and congressional campaigns, political persuasion techniques, political advertising, power in language, and media aspects of political information. Ideology, resistance to political manipulation, and dependence of democracies on communication.

**COMM 450. Technologies of Human Communication****3 Credits**

Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management.

**Prerequisite:** junior or senior standing.

**COMM 455. Fundamentals of Communication and National Security  
3 Credits**

This course addresses communication perspectives informing national security, strategic intelligence, and the intelligence process. Students will examine U.S. national security history, policy, the development of the Intelligence Community, and intelligence as processes of communication. This course serves as an introduction to national security studies.

**COMM 456. Communication and the Intelligence Cycle  
3 Credits**

The course addresses communication requirements and the technical, cognitive, and cultural complexity of the collaborative research environment. Students participate in novel, team-based problem scenarios that provide the foundation for acquiring advanced cognitive analytic methods and strategies. Students will engage in interdisciplinary information science processes and will develop and present analytic products responding to national security requirements.

**COMM 457. Strategic Communication and Public Diplomacy  
3 Credits**

This course covers history, theory, and research related to the use of communication to change attitudes in favor of U.S. national security interests. Students will examine the use of strategic communication and influence in diplomacy, intelligence, and military communities in terms of specific strategies, effects, and issues. Students will learn to distinguish public diplomacy, information operations, public affairs, and other forms of political communication that are used by the U.S. government to persuade target populations about American interests and goals. Topics include soft power, intelligence-based negotiation processes, and research methods used to identify influence techniques or groups that threaten U.S. national security.

**COMM 458. Intercultural Communication and National Security  
3 Credits**

This course provides a concentration on cultural factors in international affairs and conflicts, how culture affects perceptions of national interests, and the relationship of U.S. national security to understand the general and political cultures of other nations. Students will integrate cultural and intercultural communication theory and behavior, with an emphasis on the development of specific communication skills to facilitate developing cultural knowledge in government and political contexts. Students will learn how to study the cultural factors that affect international conflicts and how strategic communication should address such cultural factors.

**COMM 460. Deception and Communication  
3 Credits**

Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation.

**COMM 462. Family Communication  
3 Credits**

A communication perspective on traditional and nontraditional family configurations, roles, interaction patterns, and conflict. Includes an examination of media depictions of families and family interaction, as well as current social and political issues related to the family.

**COMM 465. Nonverbal Communication  
3 Credits**

Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process.

**COMM 470. Leadership Communication  
3 Credits**

Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions.

**COMM 471. Sports Communication  
3 Credits**

This course provides a senior-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fanship and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 571.

**COMM 475. International Communication  
3 Credits**

Exploration of the forms and channels of communication substantially influenced by international cultural and political factors. Covers: global communication technology; news, information and entertainment flows; international diplomacy and negotiation, communication in war and peace.

**COMM 477. Environmental Communication  
3 Credits**

Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment.

**COMM 480. Health Communication  
3 Credits**

Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures.

**COMM 484. Verbal Communication  
3 Credits**

Examination of rules governing conversational structures such as speech acts, action sequences, topics and topic shifts. Also covers humor in conversation and conversational control.

**COMM 485. International Teaching Assistant Development  
3 Credits**

International teaching assistants will receive instruction in communicative skills to enable them to meet their responsibilities at NMSU. Course includes lectures, seminars, video-taped presentations, and tutorial sessions emphasizing pedagogic and presentation skills and styles.

**Prerequisite:** consent of instructor.

**COMM 490. Independent Study  
1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.

**Prerequisites:** COMM 265G and junior standing with consent of participating instructor.

**COMM 491. Selected Topics****1-6 Credits**

Individual and/or group study of selected topics. To be identified by subtitle. May be repeated for a maximum of 12 credits.

**Prerequisite:** prior arrangement with faculty supervisor(s).

**COMM 495. Communication Internship****3 Credits**

Internship opportunity to apply what has been learned to a real-world situation. May be repeated for a maximum of 6 credits. Restricted to majors.

**Prerequisite:** junior standing and 3.0 GPA in major.

**COMM 505. Research Methods****3 Credits**

Seminar in the quantitative study of human communication phenomena, research design, and statistical analysis.

**COMM 506. Qualitative Research Methods in Communication****3 Credits**

Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research.

**COMM 540. Seminar in Political communication****3 Credits**

Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods.

**COMM 545. Seminar in Ethicism, Racism, and Communication****3 Credits**

Course focuses on theories and research concerning the social, cognitive, and communication aspects of ethnic and racial prejudice. Specific psychological and communication processes of person and group categorization are explored along with findings about the effects of ethnic prejudice on everyday communication (and vice versa).

**COMM 550. Seminar in Communication Technologies****3 Credits**

Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization.

**COMM 551. Seminar in Persuasion****3 Credits**

Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects.

**Prerequisite:** COMM 351 or consent of instructor.

**COMM 555. Seminar Fundamentals of Communication and National Security****3 Credits**

This seminar course addresses communication perspectives informing national security, strategic intelligence, and the intelligence process. Students will examine U.S. national security history, policy, the development of the Intelligence Community, and intelligence as processes of communication. This course serves as an introduction to national security studies. Graduate students are required to fulfill advanced research and presentation requirements.

**COMM 556. Seminar Communication and the Intelligence Cycle****3 Credits**

This seminar course addresses communication requirements and the technical, cognitive, and cultural complexity of the collaborative research environment. Students participate in novel, team-based problem scenarios that provide the foundation for acquiring advanced cognitive analytic methods and strategies. Students will engage in interdisciplinary information science processes and will develop and present analytic products responding to national security requirements. Graduate students will be required to fulfill advanced research and presentation requirements.

**COMM 557. Seminar Strategic Communication and Public Diplomacy****3 Credits**

The seminar course covers history, theory, and research related to the use of communication to change attitudes in favor of U.S. security interests. Students will examine the use of strategic communication and influence in diplomacy, intelligence, and military communities in terms of specific strategies, effects, and issues. Students will learn to distinguish public diplomacy, information operations, public affairs, and other forms of political communication that are by the U.S. government to persuade target populations about American interests and goals. Topics include soft power, intelligence-based negotiation processes, and research methods used to identify influence techniques of groups that threaten U.S. national security. Graduate students will be required to fulfill advanced research and presentation requirements.

**COMM 558. Seminar Intercultural Communication and National Security****3 Credits**

The seminar course provides a concentration on cultural factors in international affairs and conflicts, how culture affects perceptions of national interests, and the relationship of U.S. national security to understand the general and political cultures of other nations. Students will integrate cultural and intercultural communication theory and behavior, with an emphasis on the development of specific communication skills to facilitate developing cultural knowledge in government and political contexts. Students will learn how to study the cultural factors that affect international conflicts and how strategic communication should address such cultural factors. Graduate students will be required to fulfill advanced research and presentation requirements.

**COMM 562. Seminar in Family Communication****3 Credits**

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. Topics include basic family communication processes, communication in family subsystems, communication during family stress, and the role of family interaction in health and well-being. Students will explore how family relationships are built, maintained, and destroyed by communication as well as the potentially important and long lasting effects of family relationships on individuals.

**COMM 565. Seminar in Nonverbal Communication****3 Credits**

This course focuses on human physical behaviors as the basis of communication between persons. This physical behavior includes such variables as the voice, face, eyes, posture, gesture, space, territory, clothing, and touch. The content of the course considers the individual and social factors affecting the production of such behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships. Applications of research and theory in nonverbal communication to infant development, personality, sex differences, marital satisfaction, relationship development, culture, aging, and brain functioning are also studied throughout the course.

**COMM 570. Seminar in Organizational Communication****3 Credits**

Communication strategies and patterns of private and governmental organizations, including research on communication systems.

**COMM 571. Seminar in Sports Communication****3 Credits**

This seminar provides a graduate-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fanship and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 471.

**COMM 576. Seminar on Communication and Culture****3 Credits**

Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures.

**COMM 583. Seminar in Theories of Communication****3 Credits**

Communication systems, symbolic processes, analysis of messages.

**COMM 584. Seminar in Interpersonal Communication****3 Credits**

Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs.

**COMM 590. Independent Study****1-6 Credits**

Individualized, self-paced projects.

**Prerequisite:** consent of instructor.

**COMM 591. Special Topics****1-9 Credits**

Individual and/or group study of special topics. To be identified by subtitle.

**Prerequisite:** prior arrangement with faculty supervisor(s).

**COMM 595. Communication Internship for Graduate Students****3 Credits**

Internship opportunity to apply what students have learned to the real world. Restricted to majors.

**Prerequisite:** 9 credits of M.A. degree.

**COMM 599. Master's Thesis****15 Credits**

Thesis.

## CSEC - CYBERSECURITY (CSEC)

**CSEC 275. Introduction to Cryptography****3 Credits**

Introduction to the foundation of cryptography, principles behind cryptographic design, and cryptographic applications. Topics include encryption techniques, common cryptographic protocols and security functions. Restricted to Community Colleges campuses only.

**Prerequisite(s):** MATH 120.

**CSEC 280. Introduction to Cyber Defense****3 Credits**

Introduction to computer network attacks and countermeasures used to reduce threat exposure to individuals and organizations. This course will examine common types of cyber threats and current industry standard techniques to defend against common cyber-attacks.

**Prerequisite(s)/Corequisite(s):** OECS 269. Restricted to Community Colleges campuses only.

**CSEC 285. Introduction to Managing Information Security****3 Credits**

Managerial aspects of information security and assurance including access control models, information security governance, accountability metrics, legal responsibilities, and information security program assessment.

**Prerequisite(s)/Corequisite(s):** A ST 251G or STAT 251G. Restricted to Community Colleges campuses only.

## CTFM-CLTHNG/TXTLS/FSHN MRCHDSG (CTFM)

**CTFM 178. Fundamentals of Fashion****3 Credits**

Survey of the fashion business from fiber to end product.

**CTFM 202. Fashion Practicum****1-3 Credits (1-3)**

Applied field experience in the related areas of apparel design, fashion merchandising, and textile science. May be repeated up to 3 credits.

Restricted to: CTFM majors. Restricted to Las Cruces campus only.

**CTFM 270. Fashion Illustration****3 Credits (1+4P)**

Human figure sketches and fashion illustration as a form of communication. Emphasis on color, proportion, cut, and fabric detail.

**Prerequisites:** ART 110G.

**CTFM 273. Concepts in Apparel Construction****3 Credits (1+4P)**

Application of generalizations and principles of garment construction to varied fabrics and designs. Analysis and evaluation of apparel merchandise with emphasis on the quality of garment construction.

Restricted to: Main campus only. Restricted to CTFM, FCSE majors.

**CTFM 289. Fashion Studio I****3 Credits**

Applied principles in the criteria of pattern making: flat pattern and draping techniques. Projects will require three dimensional approaches in apparel design. Restricted to: CTFM majors. Restricted to Las Cruces campus only.

**CTFM 300. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. Restricted to Las Cruces campus only.

**Prerequisite(s):** CTFM 178; CTFM 270.

**CTFM 366. Historic Fashion****3 Credits**

The study of clothing styles from 3500 BC through the 20th century. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 255 and CTFM 270.

**CTFM 371. Textile Science****3 Credits (1+4P)**

Study of fabrics used for modern clothing, furnishings, and miscellaneous end uses. Textiles testing procedures explored.

**Prerequisites:** CHEM 110G or consent of instructor.

**CTFM 372. Fashion Merchandising****3 Credits**

The apparel industry from designing through manufacturing and distribution to retailers.

**Prerequisites:** CTFM 178.

**CTFM 373. Advanced Apparel Techniques****3 Credits**

This course builds upon concepts introduced in Concepts in Apparel Construction. An in-depth study of fabric selection, advanced garment construction and tailoring. New technologies applied to sewing construction will be explored. The use of computerized sewing machines will be incorporated. Restricted to CTFM majors.

**Prerequisite(s):** CTFM 255 and CTFM 273.

**CTFM 374. The Production of Textile and Fashion Accessories****3 Credits**

The production of textiles and fashion accessories for retail. Merchandising techniques for wholesale and retail companies. Consent of Instructor required. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 178 and CTFM 270.

**CTFM 384. Clothing for Special Needs****3 Credits**

Selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as for active sportswear, the handicapped, the elderly, and various specialty populations.

**Prerequisite:** consent of instructor.

**CTFM 402. Field Experience Marketing Training****1-3 Credits (1-3)**

Practical experience in clothing manufacturing or retailing. Supervised by resident faculty and supervisor at the work site. Report required. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CTFM majors.

**CTFM 460. Cultural Perspectives in Dress****3 Credits**

Explores the social, psychological and cultural aspects of dress and appearance which includes the relationship of dress to physical and social environments, aesthetic and personal expression and cultural ideas and values.

**Prerequisite(s):** CTFM 255 and CTFM 366.

**CTFM 474. Fashion Promotion****3 Credits**

This class focuses on the comprehensive nature of promotion in the merchandising environment of fashion related goods. Consent of Instructor required. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 255 and CTFM 372.

**CTFM 475. Fashion Buying****3 Credits**

Fundamental principles and procedures for successful merchandising of fashion goods, responsibilities of buyers, fashion trends, consumer demands, and merchandising arithmetic.

**Prerequisites:** ACCT 221, CTFM 372, and CTFM 474.

**CTFM 476. Apparel Design by Draping and Pattern Drafting****3 Credits (1+4P)**

Theory and application of draping and drafting garment patterns

(required lab). Consent of Instructor required. Restricted to: CTFM majors.

**Prerequisite(s):** CTFM 255, CTFM 270 CTFM 273, and CTFM 373.

**CTFM 492. Special Problems****1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

**CTFM 571. Textile Science****3 Credits (1+4P)**

Fabrics used for modern clothing, furnishings, and miscellaneous end uses. Explores textiles testing procedures. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for CTFM 371.

**Prerequisite:** CHEM 110G or consent of instructor.

**CTFM 572. Fashion Merchandising****3 Credits**

Covers the apparel industry from designing through manufacturing and distribution to retailers. Students enrolling in the 500-level class will be required to complete additional assignments beyond what is required for CTFM 372.

**Prerequisites:** CTFM 178 or consent of instructor.

**CTFM 584. Graduate Study in Clothing for Special Needs****3 Credits (1+4P)**

Graduate study in the selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as active sportswear, handicapped, elderly, and various specialty populations.

**Prerequisites:** CTFM 476.

**CTFM 598. Special Research Programs****1-4 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

## DANC-DANCE (DANC)

**DANC 101G. Dance Appreciation****3 Credits**

An investigation of movement, dance and choreographic work as a vehicle for understanding culture. Includes concepts in dance appreciation, themes and purposes of dance analysis of dance works, exposure to different styles of dance and understanding the roles and effects of major historical periods. Restricted to: Main campus only.

**DANC 102. Introduction to Hip-Hop Dance****1 Credit**

This course is an introduction to Hip-Hop dance. The movement material will cover West coast and Southern styles with the inclusion of the history and evolution of Hip-Hop dance. No previous dance experience required. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**DANC 109. Argentine Tango I****1 Credit**

Introduction to skills and techniques of Argentine Tango.

**DANC 118. West Coast Swing I****1 Credit**

Students will learn to dance the smooth style of Swing. The West Coast Swing may be danced to ANY style of music that has a beat (Country, R&B, Hip Hop, Disco, House). Also featured is the Hustle (fast paced and exhilarating). May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**DANC 120. Ballet Folklorico I****1 Credit**

Introductory course in folklorico dances of New Mexico and Mexico. May be repeated for a maximum of 2 credits.

**DANC 121. Beginning Country Western Dance****1 Credit**

Beginning County Western dance, including Country Western two-step, nightclub two-step, polka, and Country Western line dance. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**DANC 122. Introduction to Latin Social Dance****1 Credit**

Introduction to Latin social dance for non dance majors. Students will learn basic Latin dance technique and partnering work. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**DANC 123. Ballet Technique I****1 Credit**

Introduction to basic ballet technique, vocabulary, and history. Includes practical application of anatomical placement, posture and control through participation and academic study. May be repeated for a maximum of 2 credits.

**DANC 124. Jazz Technique I****1 Credit**

Introduction to basic jazz technique, styles, and history through participation and academic study. May be repeated for a maximum of 2 credits.

**DANC 125. Introduction to Ballroom Dance****1 Credit**

Introduction to ballroom dance for non dance majors. Students will learn basic ballroom technique and partnering work. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**DANC 126. Modern Dance Technique I****1 Credit**

Introduction to and development of basic modern dance technique, history, and aesthetics through participation and academic study. May be repeated for a maximum of 2 credits.

**DANC 127. Tap Dance I****1 Credit**

Introduction to skills and techniques of tap dance. May be repeated for a maximum of 2 credits.

**DANC 128. Latin Club Dance****1 Credit**

Introduction to the most popular Latin Club Dances to include the Salsa, Merengue, and Bachata. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**DANC 129. Flamenco I****1 Credit**

Introduction to skills and techniques of flamenco dance. May be repeated for a maximum of 2 credits.

**DANC 151. Master Works****1 Credit**

This course investigates the work of master choreographers in contemporary, Spanish, and social dance styles. Students will engage in exploring concepts in dance appreciation, themes and purposes of dance by analyzing dance works using principles, elements, and process of compositional design. This course will require students to communicate their opinions through verbal discussions, group projects, and written assignments. Restricted to Las Cruces campus only.

**DANC 200. Dance Pedagogy: Educational Theory****1 Credit**

This course will examine how people learn cognitively, physically, and emotionally so that students can become better at self-teaching and self-assessment. Students will study several educational theories and how they relate to dance. Restricted to Las Cruces campus only.

**DANC 202. Dance Ensemble****1 Credit**

This course will include learning the elements of dance composition. The students in this course will be the dancers for the students in Dance Choreography II. This course is a requirement for freshman dance majors whose emphasis is in contemporary dance. May be repeated up to 2 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 203. Dance Production I****1 Credit**

Students will learn the production process of dance events which may include performances, festivals, workshops, conferences. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 204. Dance Sport I****1 Credit**

Performance-based, team formation dance in a variety of Latin and ballroom dances. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of instructor and one of DANC 121, DANC 122, DANC 125, or DANC 128.

**DANC 205. Contemporary Dance Ensemble I****1 Credit**

Performance-based instruction for students pursuing a career in contemporary dance. Instruction includes contemporary dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 206. Spanish Dance Ensembles I****1 Credit**

Performance-based instruction for students pursuing a career in dance with an emphasis in Spanish Dance. Instruction includes dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 209. Argentine Tango II****1 Credit**

Intermediate study in Argentine tango. Learn advanced patterns, techniques and partnering skills. May be repeated up to 2 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of instructor.

**DANC 210. Classical Spanish II****2 Credits (1+3P)**

The study of theory, techniques, and practice of Classical Spanish at the intermediate level. Includes historical and cultural contexts of this art form. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 129.

**DANC 212. Intermediate Hip-Hop Dance****2 Credits**

This course is for students who have experience in Hip-Hop dance. The movement material will cover West coast and Southern styles with the inclusion of the history and evolution of Hip-Hop dance. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 218. West Coast Swing II****2 Credits**

Students will take their West Coast Swing & Hustle to the next level. Learn Intermediate and Advanced figures and techniques in both dances. Students will also enjoy advanced study on musicality and blending to create new amalgamations as well as practice in advanced leading & following techniques. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 118.

**DANC 221. Country Western Dance****2 Credits**

Intermediate skills in country/western two-step, nightclub two-step, polka, and Western line dances. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 121 or consent of instructor.

**DANC 222. Bronze American Rhythm****2 Credits (1+2P)**

Bronze level American Rhythm patterns, techniques, and partnering with emphasis on elements of dance. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 223. Ballet Technique II****2 Credits**

Continued study of classical ballet technique, vocabulary, and history through participation and academic study. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 224. Jazz Technique II****2 Credits**

Continued study of jazz technique and history through participation and academic study. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 225. Bronze American Smooth****2 Credits (1+2P)**

Bronze level American Smooth patterns, technique, and partnering with an emphasis on the elements of dance. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 125 or consent of instructor.

**DANC 226. Modern Dance Technique II****2 Credits**

Continued study of postmodern dance technique and history through participation and academic study. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**DANC 227. Tap Dance II****1 Credit**

Continued study of skills and techniques of tap dance at the advanced level. May be repeated for a maximum of 2 credits.

**Prerequisite:** DANC 127 or consent of instructor.

**DANC 229. Flamenco II****2 Credits**

The study of theory, techniques and practice of Flamenco at the intermediate level. Includes historical and cultural contexts of this art form. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** Dance 129.

**DANC 232. Bronze International Latin****2 Credits**

This is the style of Latin dance that is danced around the globe and is featured in the World DanceSport Championships. Students will learn the Bronze Level figures and techniques in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and the techniques. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 222.

**DANC 235. Bronze International Standard****2 Credits**

This is the style of Ballroom dance that is performed around the globe and is featured in the World DanceSport Championships. Learn the Bronze Level figures and techniques in five (5) International Style dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on understanding technical Elements of Dance, memorizing and performing routines. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** DANC 225.

**DANC 269. DanceSport Choreography I****2 Credits**

An introduction to the process and theory behind creating original choreography for both performance and competition level dance. With focus on the individual couple, gain necessary skills, knowledge and practice in choreographing Ballroom, Latin, Swing &/or Nightclub dance routines in various practical settings. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 275. Dance Studio Management****3 Credits**

The study and practice of studio management. Includes study of financial procedures, marketing, entrepreneurship, leadership, management, fund-raising and other related topics. Restricted to majors and minors.

**DANC 279. Flamenco Choreography I****2 Credits**

Students develop and perform solo dance studies with an emphasis placed on the development of personal movement vocabulary, phrase building, and the exploration of choreographic tools for Flamenco on stage. Discussion, critiquing, and descriptive writing about their choreographic processes will supplement direct physical work. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**DANC 280. Improvisation I****1 Credit**

Introduction and development of basic movement improvisation skills.

**DANC 289. Principles of Choreography I****2 Credits**

Solo dance choreography technique. Course must be passed with a grade of C or higher. Consent of instructor required. Restricted to: Main campus only. Restricted to Dance Majors Dance Minors majors.

**DANC 300. Dance Pedagogy: Creative Movement****3 Credits**

Teaching methods and class planning for creative movement dance curriculum at preschool and elementary school levels. Restricted to Las Cruces campus only.

**DANC 301. Flamenco Pedagogy I****3 Credits**

The methods and theory of teaching Flamenco dance forms particularly in the studio environment. Consent of Instructor required.

**Prerequisite(s):** DANC 229 AND DANC 206.

**DANC 303. Dance Production II****1 Credit**

Students will learn the production process of dance events which may include performances, festivals, workshops, conferences.

**Prerequisite(s):** DANC 203.

**DANC 304. Dance Sport II****1 Credit**

Advanced performance-based, team formation dance in a variety of Latin and social dances. May be repeated up to 4 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor and one of DANC 121, DANC 122, DANC 125, or DANC 128.

**DANC 305. Contemporary Dance Ensemble II****1 Credit**

Advanced performance-based instruction for students pursuing a career in contemporary dance. Instruction includes contemporary dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 6 credits. Consent of Instructor required.

**DANC 306. Spanish Dance Ensemble II****1 Credit**

Performance-based instruction for students pursuing a career in dance with an emphasis in Spanish Dance. Instruction includes dance repertory and choreography for stage, outdoor arenas, and site-specific areas. May be repeated up to 4 credits. Consent of Instructor required.

**DANC 310. Classical Spanish Dance III****3 Credits**

Advanced study of Classical Spanish Dance with castanets, cultural history, and pedagogy methods. A expanded focus on integration of different classical genres with focus on solo work. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 210.

**DANC 322. Silver American Rhythm****3 Credits (2+2P)**

Silver level American Rhythm patterns and technique with emphasis on performance. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 222.

**DANC 323. Ballet Technique III****3 Credits**

Intermediate/advanced study of ballet technique, including vocabulary and history. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 223 or consent of instructor.

**DANC 324. Jazz Technique III****3 Credits**

Advanced study of jazz dance, including vocabulary and history. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 224 or consent of instructor.

**DANC 325. Silver American Smooth****3 Credits (2+2P)**

Silver level American Smooth patterns and technique with emphasis on performance. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 225.

**DANC 326. Modern Dance III****3 Credits**

Intermediately advanced-level modern dance technique and study of current dance aesthetics. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 226 or consent of instructor.

**DANC 329. Flamenco III****3 Credits**

Advanced study in flamenco dance technique, its cultural history and pedagogy methods. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**DANC 332. Silver International Latin****3 Credits**

Students will learn Silver Level syllabus figures in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and Bronze Level figures in Paso Doble. Continued training and practice in International Style Latin dance technique. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 232.

**DANC 335. Silver International Standard****3 Credits**

Learn Silver Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on increased technical understanding to increase their ability in partnering and musicality. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 235.

**DANC 339. Flamenco Structure and Improvisation****3 Credits**

A Study of various elements necessary in an improvisational setting in Flamenco. Using a cross section of Flamenco forms as a format. Students study the compass of each palo, then move to several traditional letras appropriate to these forms. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 229.

**DANC 342. DanceSport Pedagogy: Rhythm  
3 Credits**

In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in four (4) Rhythm Dances to include the Rumba, Cha Cha, East Coast Swing and Mambo. Students will gain practical teacher education in the area of Private Lesson Instruction with required in class practicums. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 222.

**DANC 345. DanceSport Pedagogy: Smooth  
3 Credits**

In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in the four (4) American Style Smooth Ballroom Dances to include the Waltz, Foxtrot, Tango and Viennese Waltz. Students will gain practical teacher education in the area of Group Class Instruction with required in class practicums. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 225.

**DANC 365. Dance Pedagogy: Dance in Education  
2 Credits**

This course provides the student with methods and theories of dance education. This course will cover methods of teaching core curriculum subjects in an elementary school through body movement. This course will focus on the special needs of a kinesthetic learner.

**DANC 369. DanceSport Choreography II  
2 Credits**

Take DanceSport choreography to the next level. With focus on group formation dance, gain necessary skills, knowledge and practice in choreographing Ballroom, Latin, Swing &/or Nightclub dance routines for groups in artistic and competition settings. Consent of Instructor required.

**DANC 379. Flamenco Choreography II  
2 Credits**

Students develop and perform group studies with an emphasis placed on the development of ensemble movement vocabulary, phrase building, and the exploration of choreographic tools for Flamenco on stage. Discussion, critiquing, and descriptive writing about their choreographic processes will supplement direct physical work. Level II will advance to small group work as well as mentoring level I students. Consent of Instructor required.

**Prerequisite(s):** DANC 279.

**DANC 380. Improvisation II  
1 Credit**

Continued practice in movement improvisation with more complex examination of improvisational structures.

**Prerequisite:** DANC 280.

**DANC 389. Principles of Choreography II  
2 Credits**

Continued investigation of the choreographic process with an emphasis on group choreography. Course must be passed with a grade of C or higher. Consent of instructor required. Restricted to: Main campus only. Restricted to Dance majors Dance minors majors.

**Prerequisite(s):** DANC 289.

**DANC 400. Dance Pedagogy II  
3 Credits**

Teaching methods and class planning for dance curriculum at middle school and high school levels. May be repeated up to 3 credits.

**DANC 401. Flamenco Pedagogy II  
3 Credits**

Advanced methods and theory of teaching Flamenco dance forms particularly in the studio environment. Includes a practicum of eight onsite teaching units in a location to be determined by the designated study. Consent of Instructor required.

**Prerequisite(s):** DANC 229 AND DANC 206.

**DANC 411. Flamenco Practicum  
1 Credit**

Directed learning experiences for careers in dance. Provides the student with actual classroom teaching experience for all ages and all levels of dance students. May be repeated up to 4 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 301.

**DANC 412. DanceSport Practicum  
1 Credit**

Directed learning experiences for careers in dance. Provides the student with actual classroom teaching experience for all ages and all levels of dance students. May be repeated up to 4 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 342 or DANC 345.

**DANC 413. Dance Practicum II  
1 Credit**

This course provides the student with actual classroom teaching experience for all ages and all levels of dance students. With the supervision of the instructor, students will design a practicum experience, choose a site, and implement dance lessons. Course must be passed with a grade of C or higher. May be repeated up to 2 credits. Consent of Instructor required.

**DANC 422. Gold American Rhythm  
3 Credits (2+2P)**

Advanced level American Rhythm dance technique and partnering work with choreography and performance emphasized. Includes cultural history and pedagogy methods. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: DANC majors.

**Prerequisite(s):** DANC 322.

**DANC 423. Ballet Technique IV  
3 Credits**

Advanced study of ballet technique including vocabulary and history. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 323 or consent of instructor.

**DANC 424. Jazz Dance Technique IV  
3 Credits**

Advanced study of jazz dance techniques, including history and aesthetics. May be repeated for a maximum of 6 credits.

**Prerequisites:** DANC 324 or consent of instructor.

**DANC 425. Gold American Smooth  
3 Credits (2+2P)**

Gold level American Smooth technique and choreography with an emphasis on performance and competition dancing. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: DANC majors.

**Prerequisite(s):** DANC 325.

**DANC 426. Modern Dance Technique IV****3 Credits**

Advanced study of modern technique, including history and aesthetics. May be repeated for a maximum of 12 credits.

**Prerequisite:** DANC 326 or consent of instructor.

**DANC 432. Gold International Latin****3 Credits**

Students will complete all syllabus figures through the Gold level in the Rumba, Cha Cha, Samba, Jive and Paso Doble. Advanced training and practice in International Style Latin dance technique. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 332.

**DANC 435. Gold International Standard****3 Credits**

Students will learn Gold Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on physical and cognitive mastery of standard dance technique and elements as well as high-level performance ability, musicality and choreography. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 335.

**DANC 442. DanceSport Pedagogy: Latin****3 Credits**

This teacher education course is designed to prepare future dance professionals in the teaching of the International Style Latin dances: Cha Cha, Samba, Rumba, Paso Doble & Jive. Gain a deep understanding of all elements and be well prepared to take the DVIDA or ISTD professional certification exams. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 232 & 342.

**DANC 445. DanceSport Pedagogy: Standard****3 Credits**

This teacher education course is designed to prepare future dance professionals in the teaching of the International Style Standard dances: Waltz, Tango, Foxtrot & Viennese Waltz. Students will gain a deep understanding of all elements and be well prepared to take the DVIDA or ISTD professional certification exam. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** DANC 235 & DANC 345.

**DANC 447. DanceSport Certification Preparation****3 Credits**

The Professional Certification process offers extraordinary benefits to dance teachers, deeply enriching their dancing and teaching, and greatly expanding their career opportunities. This intensive course is designed to fully prepare students in taking the DVIDA and/or ISTD exams in the Smooth, Rhythm, Standard or Latin dances depending on course offered. See subtitle for specific style being taught in schedule of classes. May be repeated up to 12 credits. Consent of Instructor required.

**DANC 450. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**DANC 451V. World Dance****3 Credits**

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HON 347V.

**DANC 462. Flamenco Dance History****3 Credits**

An in depth study of the cross section of Flamenco and Spanish Dance traditions and genres from Spain with the influence of her colonies and the modern world from the early 1400s to Present.

**DANC 465. Senior Culminating Experience****1-6 Credits (1-6)**

Exit course for graduating seniors. Students will apply comprehensive knowledge of performance and production and/or pedagogy experience, to culminate in a dance production and/or teaching project. Restricted to majors and minors. A minimum of 2 credit hours required for graduation.

**DANC 466. Dance Pedagogy: Dance Technique****3 Credits**

Students will learn to develop a curriculum design, apply teaching methods, and structure lesson plans for teaching specific dance styles. Course must be passed with a grade of C or higher. Consent of Instructor required.

**Prerequisite(s):** DANC 300 or consent of instructor.

**DANC 489. Advanced Choreographic Project****2 Credits**

Individual directed studies in choreography with a culminating performance. Consent of Instructor required.

**DANC 499. Problems****1-6 Credits (1-6)**

Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**DANC 501. Directed Studies****1-4 Credits (1-4)**

Supervised projects and/or research in theoretical studies, inclusive of community service projects. May be repeated up to 4 credits. Consent of Instructor required.

**DANC 505. Dance Ensemble III****1 Credit**

Rehearsal and performance of dance repertory with emphasis on advanced understanding of musicality, dynamic phrasing, artistic expression, and athletic versatility within a broad range of styles. May be repeated up to 4 credits. Consent of Instructor required.

**DANC 510. Advanced Theory of Classical Spanish Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in Classical Spanish technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 310.

**DANC 522. Advanced Theory of American Rhythm Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in American Rhythm technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 322.

**DANC 523. Advanced Theory of Ballet Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in ballet technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 423.

**DANC 525. Advanced Theory of American Smooth Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in American Smooth technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 325.

**DANC 529. Advanced Theory of Flamenco Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in Flamenco technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 329.

**DANC 550. Special Topics****1-6 Credits (1-6)**

Specific subjects offered in addition to standard academic curriculum. Course title to be announced in the Schedule of Classes. May be repeated up to 6 credits. Consent of Instructor required.

**DANC 551. Movement as Social Text****3 Credits**

Investigation of the meaning of movement and dance in different cultural, social, and historical contexts in both Western and non-Western dance forms. Emphasis will be placed on the nature of movement, its unique properties, the ways in which it conveys meaning, and its relationship to culture and society. Consent of instructor required.

**DANC 566. Advanced Theory of Dance Pedagogy****1-6 Credits (1-6)**

Advanced study of dance pedagogy theory and practice. May be repeated up to 6 credits. Consent of Instructor required.

**DANC 567. Dance Internship I****2 Credits**

Internship opportunities in either dance education, dance performance/production, or dance administration. Internship site determined by both Director of Dance Program and graduate student. Consent of Instructor required.

**DANC 568. Advanced Theory of Modern Dance Technique****1 Credit**

Advanced study of dance pedagogy and theory with practice in Modern dance technique May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: DANC 426.

**DANC 570. Dance Administration and Leadership****2 Credits**

The study and investigation of both management and leadership theories and how to apply these theories in practice.

**DANC 599. Master's Thesis****1-6 Credits (1-6)**

This course is for graduate dance students who choose to write a thesis instead of a performance or teaching project. May be repeated up to 6 credits. Thesis/Dissertation Grading.

**DANC 600. Dance Research****3 Credits**

Literature review and development of research in the field of dance.

**DANC 670. Dance Internship II****3 Credits**

Internship opportunities in either dance education, dance performance/production, or dance administration. Internship site determined by both Director of Dance Program and graduate student.

**DANC 700. Doctoral Dissertation****3 Credits**

This course is for graduate dance students working toward their EdD or PhD in dance. A dissertation is required. Topic and format to be determined by dissertation committee chair and graduate student. Consent of instructor required. Restricted to Graduate Dance Majors majors.

## DAS-DENTAL ASSISTING (DAS)

**DAS 101. Introduction to Dental Assisting****2 Credits**

An introduction to the duties and responsibilities of a dental assistant. Includes brief lessons on head and neck anatomy, chair side assisting, sterilization techniques, dental office emergencies, and dental office management. Restricted to: Community Colleges only.

**DAS 111. Bio-Dental Science****4 Credits (3+3P)**

An introduction to biomedical and dental sciences with emphasis on head and neck anatomy and tooth morphology. Includes microbiology, general anatomy and physiology, histology and embryology of the oral cavity, pathology and pharmacology as they relate to dentistry.

**Corequisite(s):** DAS 113, DAS 115, and DAS 117.

**Prerequisite(s)/Corequisite(s):** PSY 201G, PHLS 150G, and HNDS 251.

**Prerequisite(s):** ENGL 111G, BIOL 154, and (COMM 253G or COMM 265G). Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**DAS 113. Dental Assisting I****4 Credits (2+6P)**

Introduction to chair side assisting procedures, instrumentation, infection control, equipment safety and maintenance, dental office emergencies, and management of pain and anxieties.

**Corequisite(s):** DAS 111, DAS 115, and DAS 117.

**Prerequisite(s)/Corequisite(s):** PSY 201G, PHLS 150G, and HNDS 251.

**Prerequisite(s):** ENGL 111G, BIOL 154, and (COMM 253G or COMM 265G).

Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**DAS 115. Dental Radiology****3 Credits (2+3P)**

Radiation physics, hygiene, and safety theories. Emphasis on the fundamentals of oral radiographic techniques and interpretation of radiographs. Includes exposure of intra-oral radiographs, quality assurance, radiographic interpretation, patient selection criteria, and other ancillary radiographic techniques.

**Corequisite(s):** DAS 111, DAS 113, and DAS 117.

**Prerequisite(s)/Corequisite(s):** PSY 201G, PHLS 150G, and HNDS 251.

**Prerequisite(s):** ENGL 111G, BIOL 154, and (COMM 253G or COMM 265G).

Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**DAS 117. Dental Materials****3 Credits (2+3P)**

Composition, chemical and physical properties, manipulation and uses of dental materials. Laboratory experiences include the application and manipulation of various materials used in dentistry.

**Corequisite(s):** DAS 111, DAS 113, and DAS 115.

**Prerequisite(s)/Corequisite(s):** PSY 201G, PHLS 150G, and HNDS 251.

**Prerequisite(s):** ENGL 111G, BIOL 154, and (COMM 253G or COMM 265G).

Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**DAS 123. Dental Assisting Practicum****6 Credits (1+15P)**

This course is the clinical component of the program that combines general practice and experiences in the work place. Seminar topics focus on the practicum experiences and critique of performance. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**Prerequisite(s):** DAS 111, DAS 113, DAS 115, and DAS 117.

**Corequisite(s):** DAS 125, DAS 127, and DAS 129.

**DAS 125. Professional Concepts****3 Credits**

Emphasis on the development of professionalism for the dental office. Includes oral communication, psychology, patient relations, problem-solving skills, stress management, and employability in addition to dental jurisprudence and ethics. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**Prerequisite(s):** DAS 111, DAS 113, DAS 115, and DAS 117.

**Corequisite(s):** DAS 123, DAS 127, and DAS 129.

**DAS 127. Dental Office Management****2 Credits**

This capstone course is an introduction to business office procedures, including telephone management, appointment control, accounts payable, completion of third party reimbursement forms, inventory control data entry for charges and payments, management recall, basic dental computer software and operating basic business equipment. Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**Prerequisite(s):** DAS 111, DAS 113, DAS 115, and DAS 117.

**Corequisite(s):** DAS 123, DAS 125, and DAS 129.

**DAS 129. Preventive Dentistry****2 Credits**

Prevention of dental diseases, oral hygiene instruction, fluoride, community dental health, and nutrition. Development, implementation and evaluation of a community dental health project. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**Prerequisite(s):** DAS 111, DAS 113, DAS 115, and DAS 117.

**Corequisite(s):** DAS 123, DAS 125, and DAS 127.

**DAS 130. Dental Assisting II****4 Credits (2+6P)**

Continuation of chair side assisting skills and techniques with a major emphasis on four-handed dentistry. This capstone course includes specialties within dentistry and expanded chair side functions. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**Prerequisite(s):** DAS 111, DAS 113, DAS 115, DAS 117, DAS 123, DAS 125, DAS 127, and DAS 129.

**DAS 131. Dental Office Management I****3 Credits**

Introduction to the field of dental office management with emphasis placed on professional verbal and written communication skills utilized within the dental office. Content includes dental terminology, charting, and back office experience as they relate to dental reception and management.

**Prerequisite(s)/Corequisite(s):** DAS 101, AHS 120, and AHS 202.

**Prerequisite(s):** ENGL 111G. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**DAS 133. Dental Office Management II****3 Credits**

Places emphasis on computer programs specifically designed for dental office management (Dentrix, Sof Dent, etc.) Expanded course content on oral communication and telephone skills, appointment scheduling, patient relations, stress management solutions, and comprehensive critical thinking/problem solving skills.

**Prerequisite(s)/Corequisite(s):** AHS 202. Prerequisite(s): ENGL 111G, DAS 101, and AHS 120. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

**DAS 155. Special Topics****1-6 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

## **DHYG - DENTAL HYGIENE/HYGIENIST (DHYG)**

**DHYG 110. Preclinical Dental Hygiene****3 Credits**

Basic scientific principles and current theory, prevention of disease transmission, ethical and professional treatment of patients, clinical learning preparation, and introduction to comprehensive patient care. Offered concurrently with DHYG 112 to provide dental hygiene students with introductory knowledge, skills and attitudes to function in the clinical setting. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 112. Preclinical Dental Hygiene Lab****3 Credits**

Clinical application to basic theories and procedures used in dental hygiene practice. Techniques of instrumentation used in performing diagnostic, preventive and therapeutic services utilized when providing comprehensive patient care. Student will practice these techniques on manikins and student partners in the clinic. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 114. Oral Histology and Embryology****2 Credits**

Introduction and description of general histology and embryology with emphasis on the microscopic structures of enamel, dentin, pulp, cementum, periodontal ligament, bone, oral mucosa, epithelial attachment and development of orofacial structures. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 116. Head and Neck Anatomy****3 Credits**

Comprehensive study of the anatomy of the head and neck regions, including skeletal, nervous, circulatory, lymphatic, and muscular systems. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 117. Dental Anatomy****2 Credits (2+1P)**

A detailed study of nomenclature, morphologic characteristics, and physiologic relationships of human primary and permanent teeth as related to the clinical practice of dental hygiene. Laboratory activities develop observation and dexterity skills. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 118. Dental Radiology****3 Credits (3+4P)**

Study of radiation physics, hygiene and safety theories. Fundamentals of oral radiographic techniques and interpretation of radiographs. Includes exposure of intra-oral radiographs, quality assurance, radiographic interpretation, patient selection criteria, ancillary radiographic techniques and application to dental hygiene treatment. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 120. Dental Hygiene Theory I****3 Credits**

Continuation of the theoretical basis for dental hygiene clinical practice. Emphasis on emergency care, planning dental hygiene care, health promotion and disease prevention, oral rehabilitation and care of appliances, modifications of dental hygiene care through the life-span, and an introduction to medically comprised patients. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 122. Clinical Dental Hygiene I****3 Credits**

Application of dental hygiene procedures on a variety of clinical patients under direct supervision of faculty. Emphasis on patient assessment and diagnosis, treatment procedures, appointment planning and prevention techniques. Theory is simultaneously related to practical experience. Offered concurrently with DHYG 120. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 124. General and Oral Pathology****3 Credits**

Introduction to general pathology with focused study of diseases and disorders of the oral cavity and their interrelationship with body systems; developmental anomalies of the teeth and jaws; manifestations of disease in the oral cavity, head and neck. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 126. Periodontology****3 Credits**

Study of normal and diseased periodontium to include the structural, functional and environmental factors. Emphasis on etiology, pathology, evaluation of disease, treatment modalities, and therapeutic and preventative periodontics relative to the hygienist's role as a co-therapist in a contemporary practice setting. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 132. Clinical Dental Hygiene II****2 Credits**

Continuation of clinical skills, patient assessment and diagnosis, treatment and appointment planning, preventive techniques and application of dental hygiene procedures at an intermediate level under the direct supervision of faculty. Clinical-based instruction helps students synthesize new knowledge, apply previous knowledge, and gain experience managing the workflow. Theory is simultaneously related to practical experience. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** "C" or above in DHYG 120, DHYG 122, DHYG 124, DHYG 126, DHYG 134.

**Corequisite(s):** DHYG 218.

**DHYG 134. Dental Materials****3 Credits (2+2P)**

Study of the composition, chemical and physical properties, manipulations, and uses of dental materials. Emphasis on materials and procedures for which the dental hygienist is directly responsible. Laboratory experiences include application and manipulation of various materials used in dentistry. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 210. Dental Hygiene Theory III****2 Credits**

Advanced theory of dental hygiene and information on periodontal therapies relative to the hygienist's role as a co-therapist in clinical practice. Continuation of the study of dental hygiene care for medically comprised patients and an introduction to special needs patients. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 212. Clinical Dental Hygiene III****4 Credits**

Continuation of clinical skills, patient assessment and diagnosis, treatment and appointment planning, preventive techniques and applications of dental hygiene procedures at the intermediate to competent level under supervision of faculty. Emphasis on dental hygiene treatment for the medically compromised and periodontally involved patients. Theory is simultaneously related to practical experience. Offered concurrently with DHYG 210. May be repeated up to 4 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 214. Dental Pharmacology****3 Credits**

Study of the pharmacologic aspects of drugs and drug groups with which the dentist and dental hygienist are directly and indirectly concerned. Emphasis is placed on nomenclature, origin, physical and chemical properties, preparation, modes of administration and effects of drugs upon the body systems. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 215. Medical and Dental Emergencies****2 Credits**

This course provides an overview of medical and dental emergencies encountered most frequently in the dental setting. It also provides the student with knowledge and techniques on how to address those emergencies should they occur. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 217. Research Methodology****2 Credits**

This course provides an introduction to the principles and application of research methods in social, behavioral and medical research. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 218. Pain and Anxiety Management****2 Credits**

Study of the application of various physical, chemical, and psychological modalities to the prevention and treatment of preoperative and postoperative patient anxiety and pain. Emphasis on administration of local anesthesia and nitrous oxide. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 219. Pain and Anxiety Management Clinical****1 Credit**

Clinical application of concepts learned in DHYG 218. Emphasis on the administration and techniques of local anesthesia and monitoring nitrous oxide. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DHYG 218.

**DHYG 220. Dental Hygiene Theory IV****3 Credits**

Theoretical preparation for advanced clinical practice. In-depth study of dental hygiene care for patients with special needs. Case Study presentations and a Board Review are utilized to demonstrate the synthesis of comprehensive dental hygiene knowledge, skills and attitudes. The most current dental and dental hygiene technology will be reviewed as it related to clinical practice. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 222. Clinical Dental Hygiene IV****4 Credits**

Clinical sessions combine basic and advanced dental hygiene skills with time management techniques essential for private practice. Comprehensive patient care to include assessment, dental hygiene diagnosis, treatment planning, implementation and evaluation of dental care, nonsurgical periodontal therapy, adjunct clinical procedures, ultrasonic instrumentation, patient management, sealants, and comprehensive programs for control of oral diseases will be emphasized. Theory is simultaneously related to practical experience. Students are encouraged to develop independent decision-making with minimal faculty supervision. May be repeated up to 4 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 224. Principles of Practice****2 Credits**

Examination of the dental hygienist's role in both traditional and non-traditional employment settings. Career planning, resume preparation and interviewing are practices. An understanding of the law, professional ethics of dental hygiene and the need for lifelong learning are emphasized. Future roles of the dental hygienist and emerging issues in dental hygiene will be explored. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 225. Dental Public Health Education****3 Credits**

Study of principles and concepts of community public health and dental health education. Emphasis on dental epidemiology and statistical methods, community assessment, educational planning, implementation, and evaluation, scientific review of literature, and classroom presentation. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

**DHYG 255. Special Topics in Dental Hygiene****1-6 Credits (1-6)**

Study of special topics related to the advanced practice of dental hygiene. May include educational methodology as well as applications in clinical practice, research, or community service. Consent of instructor required. Restricted to: Community Colleges only. Restricted to DHYG majors.

## DMS-DIAGNOSTIC MED SONOGRAPHY (DMS)

**DMS 100. Introduction to Clinical Practicum****1 Credit**

Introduction to working in the medical environment. Includes preparation for clinical internship and observation hours in the ultrasound department. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 101. Introduction Sonography/Patient Care****2 Credits**

Introduction to the careers in sonography, terminology, medical ethics, scanning planes, applications of ultrasound, professional standards and patient care. May be repeated up to 2 credits. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 116. Introduction to Vascular Technology****2 Credits**

Review of basic ultrasound physics and principles, peripheral vascular anatomy, hemodynamics, Doppler evaluation, peripheral vascular scanning techniques, physiologic testing and the carotid arteries and the peripheral vascular system. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 116 L. Vascular Technology I Lab****1 Credit**

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of the carotid arteries and peripheral vasculature utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 130. Pelvic Sonography****1 Credit**

Includes the anatomy, sectional anatomy and normal physiology of the pelvic structures; including the uterus, ovaries, prostate, pelvic muscles, lower GI, appendix and vessels as well as scanning techniques, sonographic appearance and Doppler evaluation of the pelvis. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 130 L. Pelvic Sonography Lab****1 Credit**

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of the pelvic structures including the uterus, ovaries, prostate, lower gastrointestinal system, appendix and pelvic muscles utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 140. Abdominal Sonography****3 Credits**

Includes the anatomy, sectional anatomy and normal physiology of prevertebral vessels, liver, biliary system, pancreas, upper gastrointestinal system, kidneys, adrenals, and spleen as well as scanning techniques, sonographic appearance and Doppler evaluation of the deep abdominal organs. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 140 L. Abdominal Sonography Lab****1 Credit**

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of prevertebral vessels, liver, biliary system, pancreas, upper gastrointestinal system, kidneys and spleen utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 150. Sonographic Principles and Instrumentation I****1 Credit**

Includes the fundamental properties and mathematical relationships between variables of wave parameters, acoustic variables, attenuation, pulsed wave operation, transducers, system operation, Doppler, and artifacts utilizing real-time sonographic equipment. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 160. 1st Trimester Obstetric Sonography****1 Credit**

Includes the embryology, anatomy, sectional anatomy, normal physiology, biometrics, assessment, and sonographic appearance of the 1st trimester fetus, placenta, uterus and adnexa as well as scanning techniques according to recognized protocols. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 165. 2nd/3rd Trimester Obstetric Sonography****1 Credit**

Includes the anatomy, sectional anatomy, normal physiology, biometrics, assessment, and sonographic appearance of the 2nd and 3rd trimester fetus, placenta, uterus, and adnexa as well as scanning techniques according to recognized protocols. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 170. Clinical Practicum I****2 Credits (8-10P)**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the developmental level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under direct supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 180. Clinical Practicum II****5 Credits**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the beginner level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continue observation, assistance and performance of patient care and sonographic duties under direct supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 201. Sonographic Procedures Lab****1 Credit**

Advances scanning skills, system optimization, anatomic recognition of abdominal and pelvic structures utilizing real-time sonographic equipment including Doppler. Includes sonographic evaluation of the first trimester pregnancy and normal fetus. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 216. Vascular Technology II****2 Credits**

Includes the pathology and pathophysiology of the vascular system, scanning techniques, clinical presentation, ultrasound appearance and Doppler evaluation seen with pathological conditions of the carotid arteries, deep and peripheral vascular systems. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 216 L. Vascular Technology II Lab****1 Credit**

Includes progressive development of skills following recognized protocols, scanning techniques, recognition of anatomical relationships with differentiation of normal and abnormal ultrasound appearance of the carotid arteries, deep and peripheral vascular systems utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 226. Sonographic Case Studies I****1 Credit**

Includes integration of didactic knowledge, clinical presentation, laboratory values, sonographic appearance and related medical imaging of a variety of pathological conditions through a variety of case analysis and presentations. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 227. Sonographic Case Studies II****1 Credit**

Continuation of DMS 226, integration of didactic knowledge, clinical presentation, laboratory values, sonographic appearance and related medical imaging of a variety of pathological conditions through a variety of case analysis and presentations. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 230. Gynecologic Pathology****2 Credits**

Includes the pathology and pathophysiology of the female reproductive system, scanning techniques, clinical presentation, ultrasound appearance and Doppler evaluation seen with pathological conditions of the uterus, ovaries, and adnexa. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 240. Abdominal Pathology I****2 Credits**

Includes the pathology and pathophysiology of abdominal structures of the prevertebral vessels, liver, biliary system, pancreas, spleen and gastrointestinal system; scanning techniques, ultrasound appearance, clinical presentation and Doppler evaluation seen with pathological conditions. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 245. Abdominal Pathology II****2 Credits**

Includes the pathology and pathophysiology of abdominal structures of the genitourinary system, spleen, retroperitoneum, adrenal glands, abdominal wall and prostate; scanning techniques, ultrasound appearance, clinical presentation and Doppler evaluation seen with pathological conditions. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 248. Pediatric Sonography****2 Credits**

Includes the anatomy of the brain, skull, spine, hips, and normal developmental changes as well as pathology and pathophysiology of specific conditions that affect the premature infant, newborn and pediatric population across a variety of body systems. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 250. Sonographic Principles and Instrumentation II****3 Credits**

Includes properties of sound and its use in diagnostic imaging, artifacts, system operation, Doppler, basic hemodynamics, image optimization, bio effects, quality assurance, and new technologies in ultrasound imaging. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 255. Vascular Physics****2 Credits**

Includes a review of sound properties and its use in diagnostic imaging, artifacts, system operation, Doppler, image optimization, bio effects, quality assurance, and in-depth application of fluid properties and hemodynamics in vascular ultrasound imaging. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 260. High Risk Obstetric Sonography****3 Credits**

Includes congenital malformations of the developing fetus, high risk pregnancies, multiple gestation, maternal conditions and invasive procedures. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 270. Clinical Practicum III****5 Credits**

Continued development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at an intermediate level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under limited supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 280. Clinical Practicum IV****5 Credits**

Application of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at a proficient level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under limited supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 290. Small Parts & Superficial Structures****2 Credits**

Includes anatomy, pathology and pathophysiology, protocol development, scanning techniques, recognition of anatomical structures and the normal and pathological ultrasound appearance of the breast, thyroid, neck, scrotum, non-cardiac chest and musculoskeletal ultrasound. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 291. Registry Preparation: OB/GYN****1 Credit**

Registry preparation mock examinations over materials covered in Obstetric and Gynecological ultrasound. Students must pass this course with a 74% or better OR pass national certification in OB/GYN Sonography. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 292. Registry Preparation: Abdomen****1 Credit**

Registry preparation mock examinations over materials covered in abdominal ultrasound including small parts and superficial structures. Students must pass this course with a 74% or better OR pass ARDMS national certification exam in Abdominal Sonography. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

**DMS 293. Registry Preparation: Vascular****1 Credit**

Registry preparation mock examinations over materials covered in vascular ultrasound. Students must pass this course with a 74% or better OR pass national certification in Vascular Technology. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

## DRFT-DRAFTING (DRFT)

**DRFT 101. Introduction to Drafting and Design Technologies****1 Credit**

Professional and student organizations associated with the Drafting and Design Technologies program, degree requirements, employment skills and work habits, and university and college policies and procedures will be explored. Students will be introduced to the current learning management system and career-readiness certification. Restricted to Community Colleges only.

**DRFT 105. Technical Drawing for Industry****3 Credits (2+2P)**

Technical sketching, basic CAD, and interpretation of drawings with visualization, speed and accuracy highly emphasized. Areas of focus include various trades such as machine parts, welding, heating and cooling, and general building sketches/plan interpretation.

**DRFT 108. Drafting Concepts/Descriptive Geometry****2 Credits (1+2P)**

Basic manual drafting skills, sketching, terminology and visualization. Graphical solutions utilizing applied concepts of space, planar, linear and point analyses. Metric and S.I. units introduced.

**DRFT 109. Computer Drafting Fundamentals****3 Credits (2+2P)**

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. May be repeated up to 3 credits. Crosslisted with: E T 109 and C E 109. Restricted to Community Colleges campuses only.

**DRFT 112. Drafting Concepts/Computer Drafting Fundamentals I****4 Credits (2+4P)**

Basic drafting skills, terminology, and visualization. Introduction to principles and fundamentals of computer-aided drafting. Same as E T 106.

**Prerequisites:** OECS 207, OECS 125 or consent of instructor.

**DRFT 113. Drafting Concepts/Computer Drafting Fundamentals II****4 Credits (2+4P)**

Drafting for mechanical/industrial applications; machine part detailing, assemblies in orthographic, isometric, auxiliary, oblique, and sectional views. Two-dimensional AutoCAD with introduction to 3-D AutoCAD. Same as E T 216. Restricted to: Community Colleges only.

**Prerequisite:** DRFT 112.

**DRFT 114. Introduction to Solid Modeling****3 Credits (2+2P)**

2D mechanical drafting and 3D mechanical solid modeling utilizing the latest version of AutoCAD software. Industry dimensioning and annotation standards will be emphasized. 2D multi-view working drawings, 3D solid models, and basic 3D model assemblies will be introduced. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DRFT 109.

**DRFT 115. General Construction Safety****3 Credits**

Overview of general construction safety related to building, highway and road construction, and surveying field work for entry-level individuals. Students will also have the opportunity to earn a 10-hour construction industry OSHA card. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**DRFT 120. Survey Equipment Fundamentals****2 Credits**

Introduces the application and the setup to the following surveying equipment: Automatic Level, Total station, and Global Positioning Systems. Field safety knowledge is required. Restricted to Community Colleges only.

**DRFT 130. General Building Codes****3 Credits (2+2P)**

Interpretation of the Building Code, local zoning codes, A.D.A. Standards and the Model Energy Code to study construction and design requirements and perform basic plan checking. Restricted to: Community Colleges only.

**DRFT 135. Electronics Drafting I****3 Credits (2+2P)**

Drafting as it relates to device symbols; wiring, cabling, harness diagrams and assembly drawings; integrated circuits and printed circuit boards; schematic, flow and logic diagrams; industrial controls and electric power fields. Drawings produced using various CAD software packages.

**Prerequisites:** DRFT 108 and DRFT 109.

**DRFT 143. Civil Drafting Fundamentals****3 Credits (2+2P)**

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Crosslisted with: E T 143. Restricted to Community Colleges only.

**Prerequisite(s):** DRFT 109.

**DRFT 151. Construction Principles and Print Reading****3 Credits (2+2P)**

Introduction to construction materials, methods, and basic cost estimating and print reading applicable in today's residential, commercial, and public works industry. Instruction by print reading and interpretation, field trips, and actual job-site visits and progress evaluation.

**DRFT 153. Survey Drafting Applications****3 Credits (2+2P)**

Introduction to drafting in the field of survey engineering. Drawings, projects and terminologies related to Point Data, topography, land/ boundary surveys, legal descriptions and plat surveys. Using the current Autodesk software. Crosslisted with: SUR 143. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 109.

**DRFT 160. Construction Take-Offs and Estimating****3 Credits (2+2P)**

Computing and compiling materials and labor estimates from working drawings using various techniques common in general building construction and in accordance with standard specifications and estimating formats. Use of spreadsheets and estimating software introduced.

**Prerequisite:** DRFT 151.

**DRFT 161. Introduction to Construction Management****3 Credits**

Introduction to the construction industry and construction management; construction documents and contracts; project planning, scheduling and administration; construction site management; and the role of Building Information Modeling (BIM) in construction management. Pre/ Restricted to: Community Colleges only.

**Corequisite(s):** DRFT 151 or consent of instructor.

**DRFT 164. Intermediate Mechanical Drafting/Solid Modeling****3 Credits (2+2P)**

Intermediate 3D mechanical parametric solid modeling and assembly creation utilizing the latest version of Autodesk Inventor software. The creation of 2D working drawings from 3D solid models will be emphasized. Geometric Dimensioning and Tolerancing (GD&T), basic material properties, and industry standard fastening and manufacturing methods will be introduced.

**Prerequisite(s)/Corequisite(s):** DRFT 114. Restricted to Community Colleges campuses only.

**DRFT 165. Introduction to Building Information Modeling****3 Credits (2+2P)**

Introduction to Building Information Modeling (BIM) in the development of virtual 3D building models, construction documents, renderings and basic animations related to architectural, structural, and mechanical/ electrical/plumbing building components. Utilizes the latest BIM technologies in the integration one, parametric BIM. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**DRFT 176. Solid Modeling, Rendering and Animation****3 Credits (2+2P)**

Introduction to three dimensional drafting and solid modeling, rendering and animation for architecture and engineering fields. Material application, mapping, and scene lighting will be introduced. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 109.

**DRFT 180. Residential Drafting****3 Credits (2+2P)**

Basic residential drafting including, floor plans, foundation plans, sections, roof plans, exterior and interior elevations, and site plans. Applicable residential building and zoning codes, construction methods and materials, adaptable residential design, and drawing and sheet layout for architectural drafting will be introduced. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DRFT 109.

**DRFT 181. Commercial Drafting****3 Credits (2+2P)**

Drafting principles, plan coordination, and code analysis applicable in the development of working drawings for commercial, public, and industrial building projects. Students will utilize National Cad Standards, ADA Standards, and will be introduced to modern office practice. Pre/ Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 109.

**Corequisite(s):** DRFT 180.

**DRFT 190. Finding and Maintaining Employment****2 Credits**

Techniques in self-evaluations, resume writing, application completion, job interviewing, and job retention. Exposure to work ethics, employee attitudes, and employer expectations.

**DRFT 204. Geographic Information Systems Technology****3 Credits (2+2P)**

The use of digital information for which various digitized data creation methods are captured. Users will capture, store, analyze and manage spatially referenced data in a modeled mapping procedure. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**DRFT 214. Advanced Solid Modeling****3 Credits (2+2P)**

Advanced 3D mechanical parametric solid modeling and assembly creation utilizing the latest version of Solidworks software. The creation of 2D working drawings from 3D solid models and the creation of 3D models for machining/manufacturing will be emphasized. Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standard fastening and manufacturing methods will be further explored.

**Prerequisite(s)/Corequisite(s):** DRFT 114. Restricted to Community Colleges campuses only.

**DRFT 215. Construction Site Safety Management****3 Credits**

Construction safety, compliance, documentation, and reporting requirements for individuals with construction site safety management responsibilities. Students will have the opportunity to earn a 30-hour construction industry OSHA card. Consent of Instructor required. Restricted to Community Colleges campuses only.

**DRFT 222. Surveying Fundamentals****3 Credits (2+2P)**

Elementary surveying and civil drafting theory and techniques for non engineering majors. Includes traverse plotting, site plans, mapping, cross sections, and development of plan and profile drawings. Actual basic field measurement/surveying as well as extensive manual and CAD projects will be assigned. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DRFT 109 and MATH 190G.

**DRFT 230. Building Systems Drafting****3 Credits (2+2P)**

Development of working drawings for electrical, plumbing, and HVAC systems, for residential and commercial building through the applications of both 2D Drafting and 3D Building Information Modeling (BIM) techniques. Basics of project setup, National CAD Standards, ADA Standards, modern office practice, code analysis, as well as Sustainability and LEED for new construction. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 180 or DRFT 181.

**DRFT 240. Structural Systems Drafting****3 Credits (2+2P)**

Study of foundations, wall systems, floor systems and roof systems in residential, commercial and industrial design/construction. Produce structural drawings including foundation plans, wall and building sections, floor and roof framing plans, shop drawings and details; schedules, materials lists and specifications. Use of various software. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 180 or DRFT 181.

**DRFT 242. Roadway Development Drafting****3 Credits (2+2P)**

Advanced civil/survey technology and drafting related to roadway development. Emphasis is on relevant terminology, codes/standards, and the production of complex working drawings such as topographical/grading, drainage, master utilities, roadway P P/details/etc., according to agency standards. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DRFT 143.

**DRFT 243. Land Development Drafting****3 Credits (2+2P)**

Advanced civil/survey technology and drafting related to land development. Emphasis is on relevant terminology codes/standards, and the production of complex working drawings such as subdivision plats, local utility and drainage plans, construction details roadway P P, etc., according to local development/ agency standards.

**Prerequisite:** DRFT 143 and DRFT 153.

**DRFT 250. Principles of Detailing and Design****3 Credits (2+2P)**

Advanced practice in construction documentation in the development and coordination of working drawings & specifications. In particular, will utilize Architectural Graphic Standards, National CAD Standards, and ADA standards to develop detail drawings related to Architectural, Civil, Structural and Building Mechanical systems. Will also be introduced to basic principles, factors, and process of building design such as space planning, site analysis, and basic architectural programming. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 180 or DRFT 181.

**DRFT 254. Spatial Data Processing****3 Credits (2+2P)**

Utilizes the tools and technologies of GIS, processing volumes of geodata identifying a numerical, coded or listed map. Involves the analysis of spatial data from various diverse applications and place in a descriptive mapping process. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DRFT 204.

**DRFT 255. Independent Study****1-3 Credits (1-3)**

Instructor-approved projects in drafting or related topics specific to the student's individual areas of interest and relevant to the drafting and graphics technology curriculum. Consent of instructor required. May be repeated for a maximum of 6 credits.

**DRFT 265. Advanced Building Information Modeling Applications****3 Credits (2+2P)**

Advanced applications of Building Information Modeling (BIM) including the creation of, and practice in collaborative work sets, data and design analyses, energy modeling and analysis, preliminary LEED analysis, construction take-offs & estimation, and construction animation, through use of various BIM and related software. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 165.

**DRFT 274. GIS Theory and Analysis****3 Credits (2+2P)**

Analyzes the hypothesis in which location and spatial data sufficiently quantifies the appropriate statistical methodology. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** DRFT 254.

**DRFT 276. Computer Rendering and Animation I****3 Credits (2+2P)**

Introduction to technical applications of computer generated renderings and animations for the architecture and engineering fields. 3D models, photo-realistic renderings, and basic animation movie files will be produced utilizing industry standard modeling and animation software.

**DRFT 278. Advanced CAD Applications****3 Credits (2+2P)**

Introduction to advanced CAD commands, applications, usage techniques, and user customization. the latest version of the National CAD Standards will also be explored. Restricted to: Community Colleges only.

**Prerequisite(s):** DRFT 109.

**DRFT 288. Portfolio Development****3 Credits (2+2P)**

Production of a portfolio consisting of previously produced student work related to the student's individualized degree option. Process shall include the compilation and organization of working and presentation drawings, construction documents, BIM Models, and renderings/animations. Students will learn the basics of design layout and online portfolio documentation. Job search and resume preparation activities will also be required. Production of new material and content may also be required. This course is designed as a last semester course in the Drafting & Design curricula. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Consent of Instructor.

**DRFT 290. Special Topics****1-4 Credits (1-4)**

Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**DRFT 291. Cooperative Experience****1-6 Credits (1-6)**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student meets with advisor weekly. Graded S/U.

**Prerequisite:** consent of instructor.

**DRFT 295. Professional Development and Leadership DAGA****1 Credit**

Students gain experience in leadership, team building, performing community service, and membership and/or leadership in a student organization. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

## E E-ELECTRICAL ENGINEERING (E E)

**E E 100. Introduction to Electrical and Computer Engineering****4 Credits (3+3P)**

Introduction to analog (DC) and digital electronics. Includes electric component descriptions and equations, Ohm's law, Kirchhoff's voltage and current laws, ideal op-amp circuits, Boolean algebra, design of combinational and sequential logic circuits and VHDL or VERILOG. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** C- or better in MATH 190G.

**E E 112. Embedded Systems****4 Credits (3+3P)**

Introduction to programming through microcontroller-based projects. Extensive practice in writing computer programs to solve engineering problems with microcontrollers, sensors, and other peripheral devices.

**Prerequisite(s):** C- or better in E E 100.

**E E 200. Linear Algebra, Probability and Statistics Applications****4 Credits (3+3P)**

The theory of linear algebra (vectors and matrices) and probability (random variables and random processes) with application to electrical engineering. Computer programming to solve problems in linear algebra and probability.

**Prerequisite(s):** C- or better in E E 112 and MATH 192G.

**E E 201. Electric Circuit Analysis****3 Credits**

Electric component descriptions and equations. Kirchhoff's voltage and current laws, formulation and solution of RLC network equations using time domain concepts. For nonmajors only. Minimum 2.0 GPA.

**Prerequisite(s):** C or better in MATH 192G.

**E E 212. Introduction to Computer Organization****4 Credits (3+3P)**

Concepts of modern computer organization, CPU control, pipelining, memory hierarchies, memory mapping, hardware-software interface, and operating systems.

**Prerequisite(s):** C- or better in E E 112 and MATH 190G.

**E E 230. AC Circuit Analysis and Introduction to Power Systems****4 Credits (3+3P)**

Electric component descriptions and equations; complete solutions of RLC circuits; steady-state analysis of AC circuits; application to power system analysis. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 216G. Prerequisite(s): C- or better in E E 100 and MATH 192G.

**E E 240. Multivariate and Vector Calculus Applications****3 Credits**

Vector algebra, cylindrical and spherical coordinates, partial derivatives, multiple integrals. Calculus of vector functions through electrostatic applications. Divergence, gradient, curl, divergence theorem, Stokes's theorem, Coulomb's Law, Gauss's Law, electric field, electric potential. Applications in Matlab.

**Prerequisite(s):** C- or better in MATH 192G and E E 112.

**E E 300. Cornerstone Design****2 Credits**

Application and realization of engineering principles to a guided team-based design project. Formulation and implementation of test procedures, evaluation of alternate solutions and oral and written communication of the design and test results. Restricted to: E E majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** C- or better in E E 212 and E E 230.

**E E 317. Semiconductor Devices and Electronics I****4 Credits (3+3P)**

Analysis and design of opamp circuits, diode circuits and single-transistor MOS and BJT amplifiers. Introduction to solid-state semiconductor devices.

**Prerequisite(s):** C- or better in E E 230 and CHEM 111G.

**E E 320. Signals and Systems I****3 Credits**

Introduction to the modeling and analysis of continuous- and discrete-time signals and systems using time- and frequency-domain methods suitable for both mathematical approaches and computer-aided simulations. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): C- or better in E E 200 and E E 230.

**E E 325. Signals and Systems II****4 Credits (3+3P)**

Introduction to communication systems including amplitude and frequency modulation. Introduction to control systems including linear feedback systems, root-locus analysis, and graphical representations. Introduction to digital signal processing including sampling, digital filtering, and spectral analysis. May be repeated up to 4 credits.

**Prerequisite(s):** C- or better in E E 320 and MATH 392.

**E E 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radio-active waste management provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 330, G EN 330, I E 330, M E 330, WERC 330, A EN 330 and CH E 330

**E E 340. Fields and Waves****4 Credits (3+3P)**

Static electromagnetic field. Maxwell's equation and time-varying electromagnetic fields. Generalized plane wave propagation, reflection, transmission, superposition and polarization. Transmission line theory. Extensions to optical wave propagation. Applications including Time Domain Reflectometry (TDR) and fiber optic transmission. Laboratory experience with RF/microwave test equipment and optical apparatus.

**Prerequisite(s):** C- or better in E E 230, E E 240 and PHYS 216.

**E E 391. Introduction to Electric Power Engineering****4 Credits (3+3P)**

Introduction to the principles, concepts, and analysis of the major components of an electric power system. Basic electromechanics, energy conversion and source conversion, transformers, transmission lines, rectifiers, regulators, and system analysis.

**Prerequisite(s):** C or better in E E 280.

**E E 395. Introduction to Digital Signal Processing****4 Credits (3+3P)**

Undergraduate treatment of sampling/reconstruction, quantization, discrete-time systems, digital filtering, z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications. Laboratory will emphasize practical implementation of signal processing including real-time signal processing. May be repeated up to 4 credits.

**Prerequisite(s):** C- or better in E E 325.

**E E 400. Undergraduate Research****1-3 Credits**

Directed undergraduate research. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of the department head.

**E E 402. Capstone Design****3 Credits (2+3P)**

Application and realization of engineering principles to a significant team-based design project with significant student management and autonomy. Determination of performance requirements, including safety, economics, ethics and manufacturability; extensive communication of design choices and test results to broad audiences; and interfacing of design with other hardware and software. May be repeated up to 3 credits. Restricted to: E E majors.

**Prerequisite(s):** C- or better in E E 300, E E 317, E E 325, and E E 340.

**E E 412. ASIC Design****3 Credits**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Crosslisted with: E E 512.

**Prerequisite(s)/Corequisite(s):** E E 480.

**E E 418. Capstone Design I****3 Credits (1+6P)**

Application of engineering principles to a significant design project. Includes teamwork, written and oral communications, and realistic technical, economic, and public safety requirements.

**Prerequisite(s)/Corequisite(s):** E E 461. Prerequisite(s): C or better in E E 260, E E 314, E E 351, E E 380, and E E 391.

**E E 419. Capstone Design II****3 Credits (1+6P)**

Realization of design project from E E 418 within time and budget constraints.

**Prerequisite(s)/Corequisite(s):** E E 461. Prerequisite(s): (C or better in E E 260, E E 314, E E 351, E E 380, and E E 391) OR (C or better in E E 418).

**E E 425. Introduction to Semiconductor Devices****3 Credits**

Energy bands, carriers in semiconductors, junctions, transistors, and optoelectronic devices, including light-emitting diodes, laser diodes, photodetectors, and solar cells. Taught with E E 525.

**Prerequisite(s):** C or better in E E 380 and E E 351.

**E E 426. Introduction to Smart Grid****3 Credits**

The course will serve as an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Taught with E E 546. Crosslisted with: C S 494.

**Prerequisite(s):** C- or better in E E 280.

**E E 431. Power Systems II****3 Credits**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Crosslisted with: E E 542.

**Prerequisite(s)/Corequisite(s):** E E 431 L. Prerequisite(s): C- or better in E E 230.

**E E 431 L. Power Systems II Laboratory****1 Credit**

Laboratory for Power Systems II. Crosslisted with: E E 542 L.

**Prerequisite(s)/Corequisite(s):** E E 431.

**E E 432. Power Electronics****3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems.

**Prerequisites:** C or better in E E 380 and E E 391.

**Corequisites:** E E 312 and E E 314.

**E E 443. Mobile Application Development****3 Credits**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. May be repeated up to 3 credits.

**Prerequisite(s):** C- or better in C S 172 or C S 177 or C S 187 or C S 271 or C S 451 or C S 452.

**E E 444. Advanced Image Processing****3 Credits**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Crosslisted with: E E 588.

**Prerequisite(s):** C- or better in E E 446.

**E E 446. Digital Image Processing****3 Credits**

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Taught with E E 596. **Prerequisite(s):** E E 395

**E E 447. Neural Signal Processing****3 Credits**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package that sits on top of Matlab. Taught with E E 597.

**Prerequisite(s):** C- or better in E E 314.

**E E 449. Smart Antennas****3 Credits**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive mean square, sidelobe cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 549.

**Prerequisite(s):** C or better in E E 314 and E E 351.

**E E 452. Introduction to Radar****3 Credits**

Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Taught with E E 548. Restricted to undergraduate students. Pre/

**Prerequisite(s):** C or better in E E 210 and E E 351.

**Corequisite(s):** E E 496.

**E E 453. Microwave Engineering****3 Credits**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521. Restricted to undergraduate students. Restricted to: Main campus only.

**Prerequisite(s):** C or better in E E 351.

**E E 454. Antennas and Radiation****4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Crosslisted with: E E 541.

**Prerequisite(s):** C- or better in E E 340.

**E E 460. Space System Mission Design and Analysis****3 Credits**

Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems.

**Prerequisite:** junior standing.

**E E 461. Systems Engineering and Program Management****3 Credits**

Modern technical management of complex systems using satellites as models. Team projects demonstrate systems engineering disciplines required to configure satellite components.

**Prerequisite(s):** Junior standing.

**E E 462. Computer Systems Architecture****4 Credits (3+3P)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Crosslisted with: E E 562.

**Prerequisite(s):** C- or better in E E 212.

**E E 467. ARM SOC Design****3 Credits**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Crosslisted with: E E 567.

**Prerequisite(s):** C- or better in E E 212 and E E 317.

**E E 469. Communications Networks****3 Credits (2+3P)**

Introduction to the design and performance analysis of communications networks with major emphasis on the Internet and different types of wireless networks. Covers network architectures, protocols, standards and technologies; design and implementation of networks; networks applications for data, audio and video; performance analysis. Taught with E E 569.

**Prerequisite(s):** C or better in E E 162 and (E E 210 or STAT 371).

**E E 473. Introduction to Optics****4 Credits (3+3P)**

The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Crosslisted with: PHYS 473.

**Prerequisite(s):** PHYS 216 or PHYS 217.

**E E 475. Automatic Control Systems****4 Credits (3+3P)**

Mathematical modeling of physical control systems in form of differential equations, transfer functions, and state-variables. System performance indices of feedback control systems via classical frequency-domain techniques and time-domain methods. Computer-aided solution of real-world design problems.

**Prerequisite(s):** C- or better in E E 325.

**E E 476. Computer Control Systems****3 Credits**

Representation, analysis and design of discrete-time systems using time-domain and z-domain techniques. Microprocessor control systems.

**Prerequisite(s):** C or better in E E 314.

**E E 478. Fundamentals of Photonics****4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures.

Taught with E E 528. Recommended foundation: E E/PHYS 473.

Crosslisted with: PHYS 478.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**E E 479. Lasers and Applications****4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Taught with E E 529. Crosslisted with: PHYS 479

**Prerequisite(s):** C or better in E E 351 or PHYS 461.

**E E 480. Introduction to Analog and Digital VLSI****4 Credits (3+3P)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication and CAD tools. Crosslisted with: E E 510.

**Prerequisite(s):** C- or better in E E 260 and E E 380.

**E E 482. Electronics II****3 Credits**

Feedback analysis, application of operational amplifiers, introduction to data converters, analog filters, oscillator circuits..

**Prerequisite:** C or better in E E 380.

**E E 485. Analog VLSI Design****3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523. Restricted to undergraduate students. Restricted to: Main campus only.

**Prerequisite(s):** C or better in E E 312 and E E 480.

**E E 486. Digital VLSI Design****3 Credits**

An introduction to VLSI layers. Static and dynamic logic design, memory circuits, arithmetic operators, and digital phase-locked loops. Taught with E E 524. Restricted to undergraduate students.

**Prerequisite(s):** C or better in E E 260 and E E 380.

**E E 486 L. Digital VLSI Design Laboratory****1 Credit**

Simulation, schematic capture, layout, and verification using software tools of material presented in E E 486. An introduction to measurement of digital VLSI circuits. Taught with E E 524L. Pre/

**Prerequisite(s):** C or better in E E 260 and E E 380.

**Corequisite(s):** E E 486.

**E E 490. Selected Topics****1-3 Credits**

May be repeated for a maximum of 9 credits. Graduate students may not use credits of E E 490 toward an M.S. or Ph.D. in electrical engineering.

**Prerequisite:** consent of instructor.

**E E 493. Power Systems III****3 Credits**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543. Restricted to undergraduate students. Pre/

**Prerequisite(s):** C or better in E E 391.

**Corequisite(s):** E E 431.

**E E 496. Introduction to Communication Systems****4 Credits (3+3P)**

Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems.

**Prerequisite(s):** C or better in E E 314.

**E E 497. Digital Communication Systems I****3 Credits**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Taught with E E 581. Recommended foundation: E E 496.

**Prerequisite(s):** E E 210 and E E 314.

**E E 501. Research Topics in Electrical and Computer Engineering****1 Credit**

Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering.

**E E 510. Introduction to Analog and Digital VLSI****4 Credits (3+3P)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication and CAD tools. Recommended preparation is E E 260 and E E 380 or equivalent. Taught with E E 480 with differentiated assignments for graduate students. Crosslisted with: E E 480.

**E E 512. ASIC Design****3 Credits**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Recommended foundation is E E 480. Crosslisted with: E E 412.

**E E 514. Biosensor Electronics****3 Credits**

Course provides students with knowledge of basic integrated analog and RF blocks and how to combine these circuits into sensory systems for biomedical applications. Target areas are in physiology, brain-machine interfaces, neural recording and stimulation. Lecture includes details on amplifiers, current-mode circuits, A/D converters, low-power radio transmitters and receivers, and simulation and layout of VLSI circuits. Lectures are in the form of recent paper reviews and discussion. Includes teamwork, written and oral communication, and realistic technical requirements. Pre/

**Prerequisite(s):** E E 486 OR E E 524.

**Corequisite(s):** E E 485 OR E E 523.

**E E 515. Electromagnetic Theory I****3 Credits**

Electromagnetic theory of time-harmonic fields in rectangular, cylindrical and spherical coordinates with applications to guided waves and radiated waves. Induction and equivalence theorems, perturbational and variational principles applied to engineering problems in electromagnetics. Recommended preparation is E E 351 or equivalent. Restricted to: Main campus only.

**E E 516. Electromagnetic Theory II****3 Credits**

Continuation of E E 515.

**E E 518. Integrated Power Management Circuits****3 Credits**

Design and analysis of power management integrated circuits, including linear voltage regulators, voltage references, buck, boost, and buck-boost DC-DC converters, and charge pumps. Extensive use of CAD tools are used to simulate these circuits. Pre/

**Prerequisite(s):** E E 486 or E E 524.

**Corequisite(s):** E E 485 or E E 523.

**E E 519. RF Microelectronics****3 Credits**

Knowledge of modern Radio Frequency CMOS integrated circuits, Basic Concepts in RF Design, Communication Concepts, Transceiver Architectures, Low Noise Amplifiers, Mixers, Passive Device in RF Designs, Oscillators, Phase-Locked Loops, Frequency Synthesizers, Power Amplifiers, and State-of-the-art RF systems and applications.

**Prerequisite(s):** E E 485 or E E 523.

**E E 520. A/D and D/A Converter Design****3 Credits**

Practical design of integrated data converters in CMOS/BJT technologies, OP-AMPS, comparators, sample and holds, MOS switches, element mismatches. Nyquist rate converter architectures: flash, successive approximation, charge redistribution, algorithmic, two step, folding, interpolating, pipelined, delta-sigma converters. Restricted to: Main campus only.

**Prerequisite(s):** E E 523.

**E E 521. Microwave Engineering****3 Credits**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Recommended preparation is E E 351 or equivalent. Taught with E E 453 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 522. Advanced Analog VLSI Design****3 Credits**

Design of high-performance operational amplifiers; class-AB, rail-to-rail, low-voltage, high-bandwidth, fully-differential. Design of linear operational transconductance amplifiers, high-frequency integrated filters, four-quadrant multipliers, and switched-capacitor circuits.

**Prerequisite(s):** E E 523.

**E E 523. Analog VLSI Design****3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended preparation is E E 312 and E E 480 or equivalent. Taught with E E 485 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 524. Digital VLSI Design****3 Credits**

An introduction to VLSI layers. Static and dynamic logic design, memory circuits, arithmetic operators, and digital phase-locked loops. Taught with E E 486 with differentiated assignments for graduate students. Recommended foundation: E E 260 and E E 380.

**E E 524 L. Digital VLSI Design Laboratory****1 Credit**

Simulation, schematic capture, layout, and verification using software tools of material presented in E E 524. An introduction to measurement of digital VLSI circuits. Taught with E E 486L with differentiated assignments for graduate students.

**E E 525. Introduction to Semiconductor Devices****3 Credits**

Energy bands, carriers in semiconductors, junctions, transistors, and optoelectronic devices, including light-emitting diodes, laser diodes, photodetectors, and solar cells. Recommended preparation is E E 380 and E E 351. Taught with: E E 425 with differentiated assignments for graduate students.

**E E 528. Fundamentals of Photonics****4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 478 with differentiated assignments for graduate students. Recommended foundation: (PHYS 216 or PHYS 217) and E E/PHYS 473. Crosslisted with: PHYS 528.

**E E 529. Lasers and Applications****4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Recommended foundation: E E 351 or PHYS 461. Taught with: E E 479 with differentiated assignments for graduate students. Crosslisted with: PHYS 529

**E E 530. Environmental Management Seminar I****1 Credit**

Same as CH E 530, C E 530, I E 530.

**E E 531. Power System Modeling and Computational Methods****3 Credits**

Development and analysis of fast computational methods for efficient solution of large scale power-system problems. Algorithms for constructing the bus impedance matrix; sparse matrix techniques; partial-inverse methods; compensation of mutual coupling. Pre/Restricted to: Main campus only.

**Corequisite(s):** E E 543.

**E E 532. Dynamics of Power Systems****3 Credits**

Transient and dynamic stability of power systems; synchronous machine modeling and dynamics; prediction and stabilization of system oscillations. Recommended preparation is E E 493 or equivalent. Restricted to: Main campus only.

**E E 533. Power System Operation****3 Credits**

AGC, economic dispatch, unit commitment, operations planning, power flow analysis and network control, system control centers. Recommended preparation is E E 493 or equivalent. Restricted to: Main campus only.

**E E 534. Power System Relaying****3 Credits**

Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended preparation is E E 493 or equivalent.

**E E 537. Power Electronics****3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended preparation is E E 314, E E 380, and E E 391. Taught with E E 432 with differentiated assignments for graduate students.

**E E 541. Antennas and Radiation****4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended foundation is E E 340. Crosslisted with: E E 454.

**E E 542. Power Systems II****3 Credits**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended foundation is E E 230. Crosslisted with: E E 431.

**E E 542 L. Power Systems II Laboratory****1 Credit**

Laboratory for Power Systems II. Crosslisted with: E E 431 L.

**Prerequisite(s)/Corequisite(s):** E E 542.

**E E 543. Power Systems III****3 Credits**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended preparation is E E 431 or equivalent. Taught with E E 493 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 544. Distribution Systems****3 Credits**

Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended preparation is E E 542 and E E 543. Taught with E E 494 with differentiated assignments for graduate students.

**E E 545. Digital Signal Processing II****3 Credits**

Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended preparation is E E 395 or equivalent. Restricted to: Main campus only.

**E E 546. Introduction to Smart Grid****3 Credits**

The course will serve as an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Taught with E E 426. Crosslisted with: C S 514.

**E E 548. Introduction to Radar****3 Credits**

Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended preparation is E E 310, E E 351, and E E 496 or equivalent. Taught with E E 452 with differentiated assignments for graduate students. Restricted to: Main campus only.

**E E 549. Smart Antennas****3 Credits**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 449. Recommended foundation is E E 314 and E E 351.

**E E 551. Control System Synthesis I****3 Credits**

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems.

**E E 552. Control System Synthesis II****3 Credits**

An overview of optimal controls for linear dynamical systems, analysis and design of control systems using Lyapunov techniques, control system design using semidefinite programming. An introduction to stochastic filtering and control.

**E E 562. Computer Systems Architecture****4 Credits (3+3P)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended foundation is E E 212. Crosslisted with: E E 462.

**E E 563. Computer Performance Analysis I****3 Credits**

Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 210 and E E 363.

**E E 564. Advanced Computer Architecture I****3 Credits**

Multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended preparation is E E 363 or equivalent. Crosslisted with: C S 573.

**E E 565. Pattern Recognition and Machine Learning****3 Credits**

Statistical pattern classification, supervised and unsupervised learning, feature selection and extraction, clustering, image classification and syntactical pattern recognition. Recommended preparation is E E 210 or equivalent probability and statistics and linear algebra courses.

**E E 567. ARM SOC Design****3 Credits**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages.

Recommended foundation is E E 212 and E E 317. Crosslisted with: E E 467.

**E E 569. Communications Network****3 Credits (2+3P)**

Introduction to the design and performance analysis of communications networks with major emphasis on the Internet and different types of wireless networks. Covers network architectures, protocols, standards and technologies; design and implementation of networks; networks applications for data, audio and video; performance analysis. Taught with E E 469. Recommended foundation is E E 162 and (E E 210 or STAT 371).

**E E 571. Random Signal Analysis****3 Credits**

Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems.

**E E 572. Modern Coding Theory****3 Credits**

Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation is E E 210 and E E 496.

**E E 573. Signal Compression****3 Credits**

Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing.

**Prerequisite:** E E 571.

**E E 577. Fourier Methods in Electro-Optics****3 Credits**

Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 312 and E E 528. Crosslisted with: PHYS 577

**E E 578. Optical System Design****3 Credits**

Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E/PHYS 473, E E/PHYS 528 and E E/PHYS 577. Crosslisted with: PHYS 578.

**E E 581. Digital Communication Systems I****3 Credits**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation is E E 210, E E 314, and E E 496. Taught with E E 497.

**E E 583. Wireless Communication****3 Credits**

Cellular networks, wireless channels and channel models, modulation and demodulation, MIMO, diversity and multiplexing, OFDM, wireless standards including LTE and WiMAX. Recommended foundation: E E 571 or equivalent.

**Prerequisite(s):** E E 314 or E E 571.

**E E 584. Mathematical Methods for Communications and Signal Processing****3 Credits**

Applications of mathematical techniques from estimation theory, optimization principles and numerical analysis to the problems in communications and signal processing.

**Prerequisites:** E E 571 and E E 555 or knowledge of linear algebra.

**E E 585. Telemetry Systems****3 Credits**

Covers the integration of components into a command and telemetry system. Topics include analog and digital modulation formats, synchronization, link effects, and applicable standards. Recommended preparation is E E 395, E E 496, and E E 497, or equivalent. Restricted to: Main campus only.

**E E 586. Information Theory****3 Credits**

This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression.

Restricted to: Main campus only. Crosslisted with: MATH 509

**Prerequisite(s):** E E 571 or STAT 515.

**E E 588. Advanced Image Processing****3 Credits**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Crosslisted with: E E 444.

**Prerequisite(s):** E E 446 or E E 596.

**E E 590. Selected Topics****1-9 Credits**

May be repeated for a maximum of 18 credits.

**E E 593. Mobile Application Development****3 Credits**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. Taught with E E 443 with differentiated assignments for graduate students. Recommended foundation is C++ or Java programming course. May be repeated up to 3 credits.

**E E 596. Digital Image Processing****3 Credits**

Two-dimensional transform theory, color images, image enhancement, restoration, registration, segmentation, compression and understanding. Recommended foundation is E E 571. Taught with E E 446.

**E E 597. Neural Signal Processing****3 Credits**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package that sits on top of Matlab. Taught with E E 447.

**E E 598. Master's Technical Report****9 Credits**

Individual investigation, either analytical or experimental, culminating in a technical report. May be repeated for a maximum of 18 credits. Graded PR/S/U.

**E E 599. Master's Thesis****15 Credits**

Thesis.

**E E 600. Doctoral Research****1-15 Credits**

Research.

**E E 615. Computational Electromagnetics****3 Credits**

The numerical solution of electromagnetics problems. Topics include differential equation techniques, integral equation methods, hybrid techniques, algorithm development and implementation, and error analysis. Particular algorithms, including FEM, finite differences, direct solvers, and iterative solvers, are studied.

**E E 690. Selected Topics****1-9 Credits**

May be repeated for a maximum of 9 credits.

**E E 700. Doctoral Dissertation****15 Credits**

Dissertation.

## E S-ENVIRONMENTAL SCIENCE (E S)

**E S 110G. Introductory Environmental Science****4 Credits (3+2P)**

Introduction to environmental science as related to the protection, remediation, and sustainability of land, air, water, and food resources. Emphasis on the use of the scientific method and critical thinking skills in understanding environmental issues.

**E S 256. Environmental Engineering and Science****3 Credits**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control.

Restricted to: Main campus, Alamogordo campus, Grants campus, Carlsbad campus. Crosslisted with: C E 256

**Prerequisite(s):** CHEM 111G and MATH 191G.

**E S 256 L. Environmental Science Laboratory****1 Credit**

Laboratory experiments associated with the material presented in E S 256. Same as C E 256L.

**Corequisite:** E S 256.

**E S 300. Special Topics****1-4 Credits**

Special subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester. Restricted to majors.

**E S 301. Principles of Ecology****3 Credits**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. Crosslisted with: BIOL 301

**Prerequisite(s):** BIOL 111G, A ST 311, and grade of C or better in MATH 191G or Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 191G.

**E S 312. Emergency Response to Hazardous Material Incidents****2 Credits**

EPA approved Environmental Response Training Program Course 165.15. In compliance with OSHA 29 CFR 1910.120. Normally taken during last year of study. Same as E T 312 and WERC 312.

**Prerequisite:** consent of instructor.

**E S 330. Environmental Management Seminar I****1 Credit**

Restricted to: Main campus only. Crosslisted with: A EN 330, C E 330, E E 330, I E 330, M E 330, WERC 330 and CH E 330.

**E S 361. Basic Toxicology****3 Credits**

Same as TOX 361.

**Prerequisite:** CHEM 110G or CHEM 112G and BIOL 110G.

**E S 370. Environmental Soil Science****3 Credits**

Continuation of SOIL 252 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as SOIL 370.

**Prerequisite:** SOIL 252.

**E S 391. Internship****3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**E S 422. Environmental Chemistry****3 Credits**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: CHEM 422

**Prerequisite(s):** CHEM 112G and either CHEM 211 or CHEM 313.

**E S 430. Environmental Management Seminar II****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, and related health issues, provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 430, CH E 430, E E 430, E T 430, I E 430 and WERC 430

**E S 449. Special Problems****1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E S majors.

**E S 451. Special Topics****1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

**E S 452. Geohydrology****4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits. Crosslisted with: GEOL 452 and C E 452.

**Prerequisite(s)/Corequisite(s):** MATH 121G. Prerequisite(s): Junior or Senior.

**E S 460. Introduction to Air Pollution****3 Credits**

An introduction to the physics and chemistry of tropospheric air pollution including sources of air pollution, local and long-range transport, instrumentation, regulatory requirements, control technology.

**Prerequisite(s):** PHYS 215G, CHEM 112G, MATH 191G.

**E S 462. Sampling and Analysis of Environmental Contaminants****3 Credits (1+6P)**

Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Same as ENVE 462.

**Prerequisites:** E S 256.

**E S 470. Environmental Impacts of Land Use and Contaminant****Remediation****3 Credits**

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: WSAM 470.

**Prerequisite(s):** E S 256, E S 370, E S 452, E S 462.

**E S 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: AGRO 485, HORT 486, SOIL 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**E S 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

**Prerequisite(s):** Master level graduate students.

**E S 599. Master's Thesis****1-15 Credits**

Thesis Graded: Thesis/Disertation.

**E S 605. Arid Land Water Resources****3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. Students will develop literature reviews, draft proposals, and conduct presentations. May be repeated up to 3 credits. Crosslisted with: WSAM 605.

**E S 696. Doctors Proposal****1 Credit**

Current research proposal written by PhD level graduate students. Consent of Instructor required. Crosslisted with: AGRO 696, HORT 696 and SOIL 696. Restricted to: Doctors PLEN majors.

**Prerequisite(s):** PhD level graduate students.

**E S 700. Doctoral Dissertation****1-15 Credits**

Dissertation Graded: Thesis/Disertation.

## E T-ENGINEERING TECHNOLOGY (E T)

**E T 101. Introduction to Engineering Technology****1 Credit**

The development of engineering technology, with an introduction to engineering technology, education, and practice. Graded S/U.

**E T 104. Soldering Techniques****1 Credit**

Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards.

**E T 106. Drafting Concepts/Computer Drafting Fundamentals I****4 Credits (2+4P)**

Basic drafting skills, terminology, and visualization. Introduction to principles and fundamentals of computer-aided drafting. Community Colleges only. Same as DRFT 112.

**Prerequisite:** OECS 125, OECS 207, or consent of instructor.

**E T 109. Computer Drafting Fundamentals****3 Credits (3+2P)**

Crosslisted with: DRFT 109, C E 109 and SUR 109

**E T 110. Introduction to 3-D Modeling (Solid Works)****3 Credits (2+3P)**

Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies.

**E T 120. Computation Software****2-3 Credits (2-3)**

The use of spreadsheet software in the field of engineering technology.

**E T 125. Introduction to Renewable Energy****3 Credits**

Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

**E T 153. Introduction to Computer Networks****3 Credits**

Introduction to basic computer network fundamentals including International Open Systems Interconnect (OSI), the seven-layer model, and various networking hardware devices. Community Colleges only.

**E T 154. Construction Methods and Communications****3 Credits**

Blueprint reading, specifications, and introduction to materials used in construction.

**E T 155. Network Operating Systems I****3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to: Community Colleges only.

**Prerequisite(s):** E T 120 or E T 122.

**E T 156. Introduction to Information Security****2 Credits**

This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.

**Prerequisite(s)/Corequisite(s):** E T 120. Restricted to Community Colleges campuses only.

**E T 160. Introduction to Information Engineering Technology****3 Credits**

An information engineering technology approach to the basics of computer systems and data, computer architecture, hardware and software operation, networks, and data communications. May be repeated up to 3 credits.

**E T 182. Digital Logic****3 Credits**

The use of truth tables, Boolean equations, and diagrams to define, simplify, and implement logic-valued functions.

**E T 183. Applied DC Circuits****3 Credits (2+2P)**

Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 121G.

**E T 183 L. Applied DC Circuits Lab****1 Credit**

DC applied circuits lab. May be repeated up to 1 credits.

**Corequisite(s):** E T 183.

**E T 184. Applied AC Circuits****3 Credits (2+2P)**

Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Prerequisite(s): E T 183.

**E T 184 L. Applied AC Circuits Lab****1 Credit**

AC applied circuits lab May be repeated up to 1 credits.

**Corequisite(s):** E T 184.

**E T 190. Applied Circuits****4 Credits (3+2P)**

Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab.

**Prerequisite(s)/Corequisite(s):** MATH 190G.

**E T 191. Applied Circuits Laboratory****1 Credit**

Applied Circuits Lab May be repeated up to 1 credits.

**E T 200. Special Topics****1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**E T 203. Computational Foundations****3 Credits**

Fundamental concepts of various proof techniques. These concepts will be applied to the use of computer algorithms, programming languages and other engineering and technology applications. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 190G and E T 262.

**E T 210. Intermediate 3-D Modeling (Solid Works)****3 Credits (2+2P)**

Intermediate 3-D modeling. Applied modeling of techniques to prepare for SolidWorks certification (CSWA). May be repeated up to 3 credits.

**Prerequisite(s):** E T 110.

**E T 217. Manufacturing Processes****3 Credits**

Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. May be repeated up to 3 credits. Crosslisted with: I E 217.

**Prerequisite(s)/Corequisite(s):** E T 217L. Prerequisite(s): E T 110 and MATH 121G.

**E T 217 L. Manufacturing Processes Lab****1 Credit**

Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 217.

**E T 220. Internship****1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. May be repeated up to 6 credits.

Consent of Instructor required.

**Prerequisite(s):** E T 283.

**E T 230. Introduction to Servo Systems****1 Credit**

Introduction to Servo Systems. Topics include uses of servos in the industry, servo types, loop gains and frequency response, software control systems, damping, feedback, encoders, synchros and resolvers. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 246.

**E T 240. Applied Statics****3 Credits**

Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 235G or MATH191G.

Prerequisite(s): PHYS 211G or PHYS 215G.

**E T 241. Applied Dynamics****3 Credits**

The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum. May be repeated up to 3 credits.

**Prerequisite(s):** E T 240, (MATH 235 or MATH 191G).

**E T 245. Computer Hardware Fundamentals****3 Credits (2+2P)**

Computer hardware fundamentals including architecture, interfacing, peripherals, troubleshooting, system upgrades, and maintenance. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**E T 246. Electronic Devices I****4 Credits (3+3P)**

Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers. May be repeated up to 4 credits.

**Prerequisite(s):** E T 190 or E T 184.

**E T 253. Networking Operating Systems II****3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 155.

**E T 254. Concrete Technology****3 Credits (2+2P)**

Fundamentals of aggregates, Portland cement, and asphalt used in design and construction.

**E T 255. Linux System Administration****3 Credits**

Introduction to Linux system administration.

**Prerequisite(s)/Corequisite(s):** E T 160.

**E T 256. Networking Operating Systems III****3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 253.

**E T 262. Software Technology I****3 Credits (2+2P)**

An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 182 or MATH 190G.

**E T 272. Electronic Devices II****4 Credits (3+3P)**

Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** MATH 235G or MATH 191G.

**Prerequisite(s):** E T 246.

**E T 273. Fundamentals of Networking Communications I****4 Credits (2+4P)**

Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling. Community Colleges only. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** E T 153.

**E T 276. Electronic Communications****3 Credits (2+2P)**

Antennas, transmission devices, A-M and F-M transmission and detection, pulse systems, microwave systems.

**Prerequisite(s):** E T 246.

**E T 277. Computer Networking I for IET****3 Credits (2+2P)**

Computer network design and applications for LAN to WAN, protocols, switches, bridges, routers, NT server, TCP/IP networks, network diagnostics, voice over IP, wireless networks, and the OSI layers from physical to transport. May be repeated up to 3 credits.

**Prerequisite(s):** E T 182.

**E T 280. Introduction to Multimedia****3 Credits**

Introduction to video, audio and other digital presentation methods.

**Prerequisite(s):** E T 255.

**E T 282. Digital Electronics****4 Credits (3+3P)**

Applications of digital integrated circuits, multiplexers, counters, arithmetic circuits, and microprocessors. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** (E T 190 or E T 184). **Prerequisite(s):** E T 182.

**E T 283. Hardware PC Maintenance****3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer hardware components.

**Prerequisite(s):** E T 120 or E T 122.

**E T 284. Software PC Maintenance****3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer operating systems.

**Prerequisite(s):** E T 120 or E T 122.

**E T 285. Advanced Information Security****3 Credits**

Examines the field of information security within a real-world context of issues faced by today's IT professionals. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 283. **Prerequisite(s):** E T 156.

**E T 286. Information Security Certification Preparation****4 Credits (3+1P)**

An overview of general security concepts for information technology systems.

**Prerequisite(s):** E T 285.

**E T 287. PC Disaster and Data Recovery****3 Credits**

This course provides an overview of the various causes of personal computer data failure and methods to mitigate the loss of your personal computer data. The focus is on restoring your personal computer to full PC functionality and recovering lost and damaged files after one of these unforeseen problems. In addition, the course provides a means to lessen the impact of these inevitable events with the preparation of a disaster recovery plan.

**Prerequisite(s):** E T 120 or E T 122.

**E T 290. Networking Wireless Communication****3 Credits (3+1P)**

This course provides an introduction to wireless networking and communications. Some of the topics covered are protocols, transmission methods, and IEEE 802.11 standards. Wireless LAN (WLAN) fundamentals, devices, and security, cellular telephony, broadband, and satellite communications.

**Prerequisite:** E T 273.

**E T 291. PC Forensics and Investigation****3 Credits**

Introduction to computer forensics and investigative fundamentals. Topics include understanding computer forensic and investigation law and requirements, processing crime and incident scenes, and the extraction, preservation, analysis and presentation of computer-related evidence.

**Prerequisite(s):** E T 120 or E T 122.

**E T 300. Special Topics****1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**E T 302. Manufacturing Data Analysis****3 Credits**

Methods for analyzing data collected during manufacturing processes. Emphasis placed on production control utilizing results of statistical methods and design of experiments.

**Prerequisite(s):** MATH 235.

**E T 305. Introduction to Product Design****3 Credits (2+3P)**

The process of designing an innovative product for a real customer. Working through ideas, prototypes, 3-D models, concept validation, and entrepreneurship. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 210, E T 217, and (COMM 265G or COMM 253G or AXED 201G or HON 265G). Restricted to: ET U,ET M,ET C,ET E majors.

**E T 306. Fundamental and Applied Thermodynamics****3 Credits**

First and second laws, properties of substances, thermodynamic cycles including power generation and refrigeration. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 110G and E T 240 and (MATH 235G or MATH 191G) and (( PHYS 212G or PHYS 216G)and (PHYS 212GL or PHYS 216GL)).

**E T 306 L. Thermodynamics Lab****1 Credit**

Applications of thermodynamic theory to lab devices. Practice in testing, instrumentation, and data collection. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 306 and ((E T 184 201440) or (E T 190 201640)).

**E T 308. Fluid Technology****3 Credits**

Application of basic principles of fluid mechanics to practical applied problems. May be repeated up to 3 credits.

**Prerequisite(s):** (MATH 235 or MATH 191G) and E T 240.

**E T 308 L. Fluid Technology Lab****1 Credit**

Measurements in fluid statics, dynamics, and hydraulic systems. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 308. Prerequisite(s): (MATH 235 or MATH 191G), E T 240.

**E T 309V. Manufacturing: History and Technology****3 Credits**

The history of manufacturing, the technology on which it is based, and its impact on society.

**E T 310. Applied Strength of Materials****3 Credits**

Application of principles of strength of materials to practical design and analysis problems. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 236 or MATH 192G. Prerequisite(s): (MATH 235G or MATH 191G) and E T 240.

**E T 310 L. Applied Strength of Materials Lab****1 Credit**

Testing and analyzing the physical properties of materials. cursory review of Excel, PowerPoint, FEA, Instron machine, and testing standards. May be repeated up to 1 credits.

**Prerequisite(s)/Corequisite(s):** E T 310.

**E T 312. Emergency Response to Hazardous Material Incidents****2 Credits**

Same as E S 312, WERC 312.

**E T 314. Communications Systems I****3 Credits (3+2P)**

Circuits and devices used for transmission, reception, and processing of RF signals.

**Prerequisite(s):** E T 246 & MATH 190G.

**E T 317. Advanced 3-D Modeling and Design****3 Credits**

Advanced 3-D modeling with current engineering design practices. Students will use SolidWorks add-ins such as CAMWorks, Product Data Management (PDM), and Model-Based Definition in conjunction with Geometric Dimensioning and Tolerancing (GD&T) practices. Students will have the opportunity to take the Certification SolidWorks Professional Exam (CSWP). May be repeated up to 3 credits. Consent of Instructor required. Restricted to: exclude ET U,ET M,ET C,ET E majors.

**Prerequisite(s):** E T 210.

**E T 324. Signal Processing and Filtering****4 Credits (3+3P)**

Application of digital and analog signal conversion models. Discrete time signals and systems. Time and frequency domain concepts. Presentation of Fourier and Z transforms. Application of analog and digital signal filtering with and without feedback. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** (MATH 236 or MATH 191G) and ((PHYS 212G or PHYS 216G) and (PHYS 212GL or PHYS 216GL)).

Prerequisite(s): E T 272.

**E T 328. Kinematics of Machines****3 Credits (2+3P)**

Kinematic analysis of machine elements using linkages, cams, and gears. Applied design of mechanical systems using SolidWorks simulation and Excel modeling. May be repeated up to 3 credits.

**Prerequisite(s):** E T 210 and E T 241.

**E T 332. Applied Design of Structures I****4 Credits (3+3P)**

An introduction to structural analysis and design. Use of various building codes for development of allowable and factored loads on structures. Allowable stress and strength design concepts for structural components using concrete and steel. Required use of computer software such as spreadsheets, databases, and self-developed programs and design aids. May be repeated up to 4 credits.

**Prerequisite(s):** E T 310 and (MATH 236 or MATH 192G).

**E T 339. Introduction to Digital Forensics and Incident Response****3 Credits (2+3P)**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting. May be repeated up to 3 credits.

**Prerequisite(s):** E T 255.

**E T 344. Microcomputer Systems****3 Credits (2+3P)**

Microcomputer and/or microcontroller systems applications and architectures with a software emphasis using programming languages.

**Prerequisite(s)/Corequisite(s):** E T 362. **Prerequisite(s):** E T 182 and MATH 190.

**E T 354. Soil and Foundation Technology****4 Credits (3+3P)**

Fundamentals of investigation of soil properties and their importance in design, construction, and testing as related to buildings, roads, dams, and other structures. Design of foundations considering slope stability, bearing capacity and settlement. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** E T 310. **Prerequisite(s):** E T 254. Restricted to: ET U,ET E,ET M,C E,ET C majors.

**E T 355. Site/Land Development and Layout****3 Credits**

Techniques, methods, and takeoffs for infrastructure layout, site plan design, grading, earthwork, utilities, road construction. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** DRFT 143 or DRFT 153.

**E T 360V. Technology in Business and Society****3 Credits (2+2P)**

Examination of how technology affects business and society with specific attention to understanding the role of technical personnel and their interaction with nontechnical personnel.

**E T 362. Software Technology II****3 Credits**

A continuation of topics from E T 262 that are directed toward more advanced software development. Topics include problem analysis, object oriented, structured logic, and development concepts. May be repeated up to 3 credits.

**Prerequisite(s):** E T 262 and MATH 190G.

**E T 365. Building Utilities****3 Credits (2+3P)**

Basic design and code applications in plumbing and electrical systems for buildings.

**Prerequisites:** junior standing in E T.

**E T 377. Computer Networking I****3 Credits (2+2P)**

Computer network design and applications for LAN to WAN, protocols, switches, bridges, routers, TCP/IP networks, network diagnostics, voice over IP, wireless networks, and the OSI layers from physical to transport. May be repeated up to 3 credits.

**Prerequisite(s):** E T 182 and MATH 190G.

**E T 381. Renewable Energy Technologies****3 Credits**

Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 382. Solar Energy Technologies****3 Credits (2+3P)**

Solar energy technologies, including topics in passive, solar thermal, and photovoltaic systems. Theory, practical applications, safety considerations and the economics of solar renewable energy systems compared to conventional systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 384. Wind and Water Energy Technologies****3 Credits**

Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 386. Sustainable Construction and Green Building Design****3 Credits**

Sustainable Building materials, methods, and techniques including green architecture and design, codes, standards and specifications. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 121.

**E T 396. Heat Transfer and Applications****3 Credits (2+3P)**

Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design. May be repeated up to 3 credits.

**Prerequisite(s):** E T 306 and E T 308 and PHYS 212G.

**E T 398. Digital Systems****3 Credits (2+3P)**

Advanced analysis and design of digital systems using state machine logic, programming of logic devices, implementation and testing. Pre/

**Prerequisite(s):** E T 282 and MATH 190G.

**Corequisite(s):** E T 362.

**E T 400. Special Topics****1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of department head.

**E T 401. Heating and Air-Conditioning Systems****3 Credits**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. Same as M E 401.

**Prerequisite:** E T 306.

**Corequisite:** E T 396.

**E T 402. Instrumentation****3 Credits (2+3P)**

Sensors/transducers, signal conditioning and transmission for measurement and control systems. Student project in an area of instrumentation and/or control is required. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 396 or E T 398.

**E T 410. Senior Seminar****1 Credit**

Transition from academics to business and industry. Graded S/U.

**Prerequisite:** senior standing in E T.

**E T 412. Highway Technology****3 Credits**

Road-vehicle performance, geometric alignment, traffic analysis, highway materials, pavement design, and plan and profile development. May be repeated up to 3 credits.

**Prerequisite(s):** E T 354.

**E T 415. Manufacturing Management and Productivity****3 Credits**

Projects incorporating concurrent engineering, total quality management, design for manufacturability/assembly, and other contemporary topics in manufacturing.

**Prerequisites:** senior standing in E T.

**E T 418. Applied Hydraulics****3 Credits**

Introduction to hydrology, hydraulic equations, hydraulic cross-sections, control structures, and collection and distribution of water, wastewater, and storm runoff using closed conduit and open channel flow.

**Prerequisite(s):** E T 308.

**E T 420. Senior Internship****1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. Taken in the senior year of program.

**Prerequisites:** Senior standing in E T.

**E T 421. Senior Project****3 Credits**

Project in an area of civil engineering technology conducted under the direction of civil engineering technology faculty member. Project must be one that can be completed within a semester and of sufficient complexity for 3 credits. Taken last semester of program.

**E T 426. Analysis and Design of Machine Elements****3 Credits (2+3P)**

Analysis and design of power transmission components, including: gears, sprockets, belts, chains, bearings, and shafts. Experiential design project using SolidWorks and Excel modeling. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 241. Prerequisite(s): E T 210 and E T 310.

**E T 432. Applied Design of Structures II****4 Credits (3+3P)**

Continuation of E T 332. Design of structural systems and study of their responses. Wood and masonry systems included. May be repeated up to 4 credits.

**Prerequisite(s):** E T 332.

**E T 435. Senior Project****3 Credits (2+3P)**

Capstone course. Practical application of student's cumulative knowledge to an assigned design projects. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. May be repeated up to 3 credits. Consent of Instructor required.

**E T 439. Advanced Digital Forensics and Incident Response****3 Credits**

Advanced topics in digital forensics and incident response on Windows, Linux and Mac OS X and mobile devices. Topics include: Memory analysis, registry analysis, timeline analysis, malware analysis, Linux and Mac artifacts, mobile device forensics. May be repeated up to 3 credits.

**Prerequisite(s):** E T 339 and E T 377.

**E T 440. Senior Design****2 Credits (1+2P)**

Team design of a system, mechanism, or model that will be fabricated or simulated during the following semester in E T 441. Pre/

**Prerequisite(s)/Corequisite(s):** E T 444 and E T 402. Restricted to: ET C,ET E,ET M,ET U majors.

**E T 441. Senior Project****2 Credits (1+2P)**

Team fabrication or simulation, testing, and debugging of a system, mechanism or model designed in E T 440.

**Prerequisite(s):** E T 440.

**E T 444. Hardware and Software Senior Design****3 Credits (2+3P)**

The design, development, implementation, documentation and formal demonstration of a microprocessor-based application to solve an engineering problem. Emphasis on microprocessor architectural concepts and software interfacing. A student project is require

**Prerequisite(s):** E T 344 and E T 398.

**E T 454. Advanced Construction Technology****3 Credits**

Contractor design and construction methods concerning formwork, special foundations, shoring, excavations, pilings, steel erection, and various material handling components.

**Prerequisite:** E T 354 and E T 355.

**E T 455. Cost Estimating and Scheduling****3 Credits**

Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques.

**Prerequisite:** junior or senior standing in E T.

**E T 456. Applied Power Technologies****4 Credits (3+3P)**

Basic elements of modern power systems, energy sources, substation configuration, load cycles, and three-phase circuits. Students will gain experience in power factor correction, transmission line configurations and impedance, voltage regulation of transformers, and the per-unit system. Study of load flow, fault analysis, and economic operations is included. May be repeated up to 4 credits.

**Prerequisite(s):** (MATH 235 or MATH 191G) and E T 272 and ((PHYS 212G or PHYS 216G) and (PHYS 212GL or PHYS 216GL)).

**E T 458. Database Technology for Engineering****3 Credits**

MySQL and PHP. Data conversion using PHP, mysql and Python. Methods of transferring data from electronic boards and data feeds, into databases. Use of SQL in java programming. Remote programming of computers for running database systems in a mixed OS environment. Generation of web pages directly from Database queries.

**Prerequisite(s):** E T 362 and E T 160.

**E T 460. Web Technologies and Multimedia****3 Credits**

Introduction to web technologies and multimedia. May be repeated up to 3 credits.

**Prerequisite(s):** E T 160.

**E T 463. Advanced Linux and Python Scripting****3 Credits**

Advanced Linux Includes installation and maintenance of Unix/Linux/Windows versions of Python. Use of Python to solve numerous engineering problems including video and audio. Image manipulation. Using PostScript for image and typesetting development. Integration of C programming with Python.

**Prerequisite(s):** E T 255 and E T 362.

**E T 464. Advanced Windows Server Administration****3 Credits**

Learn about configuration and maintenance of Microsoft Windows Server and related services such as DHCP, DNS, Failover Clusters, Active Directory, Group Policy, File Sharing, Microsoft SQL server, Microsoft Exchange Server, IIS, Network Load Balancing, Backups, Remote Administration, PowerShell scripting and more. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** E T 339. Prerequisite(s): E T 362.

**E T 472. Intelligent Transportation Systems (ITS)****3 Credits**

Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required.

**E T 477. Computer Networking II****3 Credits**

Advanced concepts in computer network design and applications including managing the campus network, virtual LANs (VLAN), network security, wireless networks, high-speed optical networks, and voice over IP. May be repeated up to 3 credits.

**Prerequisite(s):** E T 277 or E T 377.

**E T 480. Innovation and Product Development****3 Credits**

Experiential product design and development. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** (COMM 265G or COMM 253G or AXED 201G or HON 265G).

**E T 482. Advanced Manufacturing****3 Credits (2+2P)**

Fundamentals of computer aided manufacturing (CAM) and computer numerical control (CNC) machining. Students will learn how to program several variants of CNC machines, using both G/M code programming and computer aided manufacturing software. Emphasis will be on the effective design of parts to be made on CNC machines along with a hands on lab to give students experience on CNC machines. Students will individually design, manufacture, and keep items such as keychains, bottle openers, LED clocks, ergonomic handles, and license plates. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** E T 210 and E T 217.

**E T 490. Selected Topics****1-3 Credits**

Selected topics in engineering technology and related areas.

**Prerequisite:** consent of instructor.

## ECDV-ECONOMIC DEVELOPMENT (ECDV)

**ECDV 550. Introduction to Local and Regional Development****3 Credits**

Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.

**ECDV 590. Special Topics****1-3 Credits (1-3)**

Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.

**ECDV 596. Individual Study****1-3 Credits (1-3)**

Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.

**ECDV 651. Economic Development Theory****3 Credits**

Builds upon a general understanding of microeconomic and macroeconomic theory to focus specifically on theories of economic development at all levels. Prerequisites: AEEC 501 and 502

**ECDV 661. Regional Economic Modeling I****3 Credits**

Provides an introduction to the basic tools and methods of regional economic development analysis.

**Prerequisite(s):** AEEC 501, AEEC 502, and AEEC 540.

**ECDV 662. Regional Economic Modeling II****3 Credits**

Continuation of ECDV 661 with focus on more advanced tools and methods of regional economic development analysis.

**ECDV 664. Population Economics****3 Credits**

Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.

**ECDV 668. Economic Development Finance****3 Credits**

Focuses on the tools and methods of economic development finance.

**ECDV 670. Research in Economic Development****3 Credits**

Intense examination of the academic literature on economic development at all levels.

**Prerequisites:** ECDV 651, ECDV 661 and ECDV 662.

**ECDV 671. Sustainable Economic Development****3 Credits**

Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment.

**Prerequisites:** AEEC 501, AEEC 502 and AEEC 540.

**ECDV 673. Research Methods****3 Credits**

An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized.

**Prerequisites:** AEEC 501, AEEC 502 and AEEC 540.

**ECDV 681. Urban Economic Development****3 Credits**

Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis.

**Prerequisites:** ECDV 651, ECDV 661 and ECDV 662.

**ECDV 682. Rural Development****3 Credits**

Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis.

**Prerequisites:** ECDV 651, ECDV 661 and ECDV 662.

**ECDV 683. Seminar in National Economic Development****3 Credits**

Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects.

**Prerequisites:** ECDV 681 and ECDV 682.

**ECDV 692. Seminar in Economic Development****3 Credits**

Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits.

**Prerequisite:** Completion of at least nine semester hours of ECDV courses.

**ECDV 694. Internship****1-9 Credits (1-9)**

Internship in Economic Development. May be repeated up to 9 credits. Restricted to: ECDV majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Completion of core requirements of Doctor of Economic Development.

**ECDV 699. Doctoral Project****1-9 Credits (1-9)**

Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

## ECED-EARLY CHILDHOOD EDUCATION (ECED)

**ECED 115. Child Growth, Development, and Learning****3 Credits**

This basic course in the growth, development, and learning of young children, prenatal through age eight, provides students with the theoretical foundation for becoming competent early childhood professionals.

**ECED 125. Health, Safety, and Nutrition****2 Credits**

This course provides information related to standards and practices that promote children's physical and mental well being sound nutritional practices, and maintenance of safe learning environments.

**ECED 135. Family and Community Collaboration****3 Credits**

This beginning course examines the involvement of families and communities from diverse cultural and linguistic backgrounds in early childhood programs. Ways to establish collaborative relationships with families in early childhood settings is discussed.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**ECED 215. Curriculum Development Through Play****3 Credits**

The beginning curriculum course places play at the center of curriculum in developmentally appropriate early childhood programs. It addresses content that is relevant for children birth through age four and developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with diverse abilities and the development of IFSP's and IEP's is included. Consent of instructor required.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**Corequisite(s):** ECED 220.

**ECED 220. Early Childhood Education Practicum I****2 Credits**

The beginning practicum course will provide experiences that address curriculum content that is relevant for children birth through age four in developmentally and culturally sensitive ways. Consent of instructor required.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**Corequisite(s):** ECED 215.

**ECED 225. Curriculum Development and Implementation II****3 Credits**

The second curriculum course focuses on developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills, is emphasized. Information on adapting content areas to meet the needs of children with diverse abilities and the development of IEP's is included. Consent of instructor required.

**Prerequisite(s):** ECED 115, ENGL 111G.

**Corequisite(s):** ECED 230.

**ECED 230. Early Childhood Education Practicum II****2 Credits**

The second field-based curriculum course focuses on practicing developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Consent of instructor required.

**Prerequisite(s):** ECED 115, ENGL 111G,.

**Corequisite(s):** ECED 225.

**ECED 235. Introduction to Language, Literacy and Reading****3 Credits**

This course is designed to prepare early childhood professionals for promoting children's emergent literacy and reading development.

Through a developmental approach, the course addresses ways in which early childhood professionals can foster young children's oral language development, phonemic awareness, and literacy problem solving skills, fluency, vocabulary, and comprehension.

**Prerequisite(s):** ECED 115 and ENGL 111G.

**ECED 245. Professionalism****2 Credits**

This course provides a broad-based orientation to the field of early care and education. Early childhood history, philosophy, ethics and advocacy are introduced. Basic principles of early childhood systems are explored. Multiple perspectives on early care and education are introduced. Professional responsibilities such as cultural responsiveness and reflective practice are examined.

**ECED 255. Assessment of Children and Evaluation of Programs****3 Credits**

This basic course familiarizes students with a variety of culturally appropriate assessment methods and instruments, including systematic observation of typically and non-typically developing children. Crosslisted with: SPED 255

**Prerequisite(s):** ECED 115 and ENGL 111G.

**ECED 265. Guiding Young Children****3 Credits**

This course explores various theories of child guidance and the practical applications of each. It provides developmentally appropriate methods for guiding children and effective strategies and suggestions for facilitating positive social interactions. Strategies for preventing challenging behaviors through the use of environment, routines and schedule will be presented.

**ECED 270. Program Management****3 Credits**

Technical knowledge necessary to develop and maintain a quality early care and education program. The course will focus on sound financial management and vision, laws and legal issues that affect programs and state and national standards including accreditation requirements.

**Prerequisite:** consent of instructor.

**ECED 275. Curriculum for Diverse Learners and Their Families****3 Credits**

Implementation of family-centered programming that includes developmentally appropriate and culturally responsive curriculum. The course will also cover the establishment and maintenance of healthy and safe learning environments. Consent of instructor required.

**ECED 276. Effective Program Development for Diverse Learners and Their Families****2 Credits**

Practical experience in observing and carrying out the role of the director/administrator in the implementation of family-centered programming that includes individually appropriate and culturally responsive curriculum in a healthy and safe learning environment. Consent of instructor required.

Restricted to ECED majors.

**Corequisite(s):** ECED 275.

**ECED 280. Professional Relationships****3 Credits**

Development of staff relationships that will foster strong professional relationships with and among families, communities and advisory boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Working effectively with board, advisory groups and community members and agencies will be addressed. Consent of instructor required.

**Corequisite(s):** ECED 281.

**ECED 281. Professional Relationships Practicum****2 Credits**

Practical experience in the development of staff relationship that will foster professional relationships with families, communities and boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Consent of instructor required. Restricted to ECED majors.

**Corequisite(s):** ECED 280.

**ECED 315. Research in Child, Growth, Development and Learning****3 Credits**

This advanced course in child growth, development, and learning builds upon the foundational material covered in the basic course in child growth, development, and learning. An integration of major theories of child development is provided by focusing on contemporary research in all aspects of development, including bio-ecological, social-affective, cognitive, language, and the methodological aspects of research in early childhood development and education. May be repeated up to 3 credits. Restricted to: TEP-ECED majors.

**Prerequisite(s):** ECED 115.

**ECED 329. Early Primary Field Placement****2 Credits**

The field practicum is a co-requisite course with Teaching and Learning Reading and Writing; Teaching and Learning Math and Science; Teaching and Learning Social Studies, Fine Arts and Movement. The field based component will provide experiences that address curriculum content and practice teaching that is relevant for early primary children in developmentally and culturally sensitive ways. Graded: S/U. May be repeated up to 2 credits. Restricted to: TEP-ECED majors. S/U Grading (S/U, Audit).

**Corequisite(s):** ECED 440, ECED 455, RDG 350.

**ECED 335. Family, Language and Cultural****3 Credits**

This course analyzes the interrelationships between family, language, and culture as connected to children's development and learning. In this course, language is understood as a human activity and higher mental process which build on the children's families, community and cultural background. May be repeated up to 3 credits. Restricted to: TEP-ECED majors.

**Prerequisite(s):** ECED 135.

**ECED 351. Emergent Literacy****3 Credits (2+2P)**

This advanced course is designed to prepare early childhood professionals to study literacy development, specifically oral language, writing and reading. This course focuses on children from birth through age 4, including children with special needs. Through a developmental approach, the course addresses: 1) recent theory and research that translates into practical strategies, assessment materials and preparation of rich literacy environments, 2) the socio-cultural contexts in which children develop literacy, 3) culturally, linguistically and developmentally appropriate literacy curricula, 4) processes used to determine the appropriateness of various literacy strategies, 5) assessment, evaluation, and accountability and 5) literacy leadership. Crosslisted with: RDG 351.

**Prerequisite(s):** ECED 235.

**ECED 395. Special Topics****1-3 Credits**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits.

**ECED 420. Integrated Early Childhood Curriculum****4 Credits**

This advanced course focuses on developmentally appropriate content, learning environments, and curriculum implementation for children birth through age 4. It emphasizes integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children.

**Prerequisite(s):** ECED 125, ECED 215, ECED 220, ECED 225, ECED 230, ECED 245, and ECED 265.

**Corequisite(s):** ECED 425.

**ECED 425. Integrated Curriculum Practicum****2 Credits**

The advanced practicum course is a field based course that will provide opportunities for the integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children.

**Prerequisite(s):** ECED 125, ECED 215, ECED 220, ECED 225, ECED 230, ECED 245, ECED 265.

**Corequisite(s):** ECED 420.

**ECED 440. Teaching and Learning Math and Science****4 Credits (2+4P)**

Standards, principles, and practices in teaching mathematics and science to young children in preschool through grade 3. An emphasis is placed on developing a content-rich integrated math and science curriculum that focuses on children's development and interests, includes appropriate content, processes, environment, and materials with an emphasis on problem-solving as the major means of constructing basic concepts. Field experience required. May be repeated up to 4 credits. Restricted to: TEP-ECED majors.

**ECED 443. Assessment of Children and Evaluation of Programs****3 Credits**

Advanced course builds on understanding the connections among learning, teaching, and assessment and strategies for evaluating programs. Assessment, identification, and monitoring of typical and atypical development in the cognitive, motor, affective and social domains. Multiple and diverse assessment approaches, including responsiveness to cultural and linguistic differences will be emphasized. Builds upon indicators of competence established at the lower division (AA) level. For each course objective (core competency) students will demonstrate the indicators established for the bachelor s level.

**ECED 452. Teaching Language Minority Children in Early Childhood Settings****3 Credits**

Framework and strategies for the educational development of young language-minority children.

**ECED 455. Teaching and Learning Social Studies, Fine Arts and Movement****3 Credits (2+2P)**

The course focuses on the aims, scope, and integration of methods of teaching social studies, the fine arts and movement across the curriculum. This course emphasizes an integrated approach to teaching the what and why of social studies; assessing student learning; planning units, lessons, and activities; effective instructional strategies; and knowledge of social studies content. Concepts of expressive art include the visual arts, music, movement and drama. May be repeated up to 3 credits. Restricted to: TEP-ECED majors.

**Corequisite(s):** ECED 329, ECED 440, RDG 350.

**ECED 458. Field Experience (Infants Pre-K)****1 Credit**

Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. Graded S/U.

**ECED 459. Field Experience (K-3)****1 Credit**

Supervised field experiences in early childhood settings: public school programs K 3. Graded S/U.

**ECED 465. Advanced Caregiving for Infants and Toddlers****3 Credits**

The advanced field-based course is intended to assist students to define and implement advanced elements of quality programming for all infants, toddlers in safe, healthy, responsive caring environments. The experiences in the approved setting will support strong nurturing relationships, cultural competence, diverse learning needs and styles of every child, appropriate guidance techniques and partnership with the families, cultures, and community represented. Students are assisted through the course in advancing their ability to observe, discuss, and implement elements of quality programming for infants and toddlers in home, small-group or whole-group care situations. Crosslisted with: SPED 465

**ECED 470. Student Teaching/Seminar****6 Credits**

Provides student teaching experience in a variety of settings with young children ages birth 8. May be repeated up to 6 credits. Restricted to: TEP-ECED majors.

**ECED 479. Curriculum in Early Childhood Education****3 Credits**

Development and implementation of curriculum and materials for teaching young children.

**ECED 489. Topics****3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated three times for a maximum of 9 credits.

**ECED 510. Issues in Early Childhood Education****3 Credits**

Examines current trends and problems through readings of theoretical, empirical, and applied literature.

**ECED 515. Working with Parents of Young Children****3 Credits**

Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs.

**ECED 520. Seminar on Cognitive and Social Development****3 Credits**

In-depth study of developmental theories: Piaget, Kohlberg, Bruner, and Erikson. Implications for development of preschool programs and teaching techniques.

**ECED 530. Leadership and Advocacy in Early Childhood****3 Credits**

The course explores a multidisciplinary approach to early childhood educational leadership, advocacy and change. The course focuses on leadership in its many forms: in teaching, administration, policy, research, and ethics. In addition, we will examine the theory and practice of change to gain an understanding of what contributes to advocating for policy and community change. Students will gain a deeper understanding of themselves as leaders, and ways to improve early education to promote social justice in programs and systems serving families and young children.

**ECED 570. Play in the Early Childhood Curriculum****3 Credits**

Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. Same as ECED 451 with differentiated assignments for graduate students.

**ECED 612. History and Philosophy of Early Childhood Education****3 Credits**

Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major.

**ECED 614. Early Childhood, Communities, and Social Policy****3 Credits**

Early childhood politics and policy taken from a global, national, state, and community context. Restricted to doctoral-level students of any major.

**ECED 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, EDUC 633, RDG 633, EDLT 633.

**ECED 698. Selected Topics in Early Childhood Education****1-6 Credits**

Offered under various subtitles. May be repeated for a maximum of 6 credits. Restricted to doctoral-level students of any major.

## ECON-ECONOMICS (ECON)

**ECON 201G. Introduction to Economics****3 Credits**

Economic institutions and current issues with special emphasis on the American economy.

**ECON 251G. Principles of Macroeconomics****3 Credits**

Macroeconomic theory and public policy: national income concepts, unemployment, inflation, economic growth, and international payment problems.

**ECON 252G. Principles of Microeconomics****3 Credits**

Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions.

**ECON 304. Money and Banking****3 Credits**

Income measurement and determination, monetary and fiscal policies. **Prerequisite:** ECON 251G or equivalent, or consent of instructor.

**ECON 311. Intermediate Macroeconomic Theory****3 Credits**

Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.

**Prerequisite(s):** ECON 251G or equivalent.

**ECON 312. Intermediate Microeconomic Theory****3 Credits**

Contemporary economic theory with emphasis upon value and distribution.

**Prerequisite(s):** ECON 252G or equivalent.

**ECON 324V. Developing Nations****3 Credits**

Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

**ECON 325V. Economic Development of Latin America****3 Credits**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems.

**ECON 332. Public Finance****3 Credits**

This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. **Prerequisites:** ECON 252

**ECON 335V. Business and Government****3 Credits**

Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGT 335G

**ECON 336. Labor Economics****3 Credits**

This course aims at developing students' understanding of how the labor market works. Topics to be covered include: labor supply and demand, wage differentials, wage structure, unemployment, gender issues, labor market discrimination, and migration.

**Prerequisite(s):** ECON 252G.

**ECON 337V. Natural Resource Economics****3 Credits**

Same as AG E 337V.

**Prerequisite:** ECON 201 or ECON 252.

**ECON 340. American Economic History****3 Credits**

The rise of big business and organized labor, increasing price rigidities, and growing government intervention. Same as HIST 340.

**ECON 384V. Water Resource Economics****3 Credits**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AG E 384V.

**Prerequisite:** AG E 100 or ECON 252G.

**ECON 401. Managerial Economics****3 Credits**

Application of economic theory to problems of business management.

**Prerequisite(s):** ECON 252G and MATH 142 or equivalent, or consent of instructor.

**ECON 404. Collegiate Advisory Board, Federal Reserve****3 Credits**

Students serve on the Collegiate Advisory Board of the El Paso branch of the Federal Reserve Bank of Dallas. Guest speakers provide an overview of the Federal Reserve System, role of monetary policy, and issues facing specific industries in the local, national, and global economies. Students prepare reports, including a final paper, on an assigned industry in the regional or state economy and the current economic performance of their industry. Students must be of junior rank or higher with a GPA of at least 3.5. Consent of Instructor required.

**ECON 405. Introductory Econometrics****3 Credits**

Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.

**Prerequisite(s):** A ST 251G or STAT 251G or A ST 311 (or equivalent).

**ECON 406. The Economics of Sports****3 Credits**

Applying the tools of economic analysis to a particular industry and gaining an in-depth knowledge of the interaction of professional sports teams and leagues with the economy and society. Same as AG E 406.

**Prerequisites:** one previous course in economics or consent of instructor.

**ECON 432V. Economics of Health Care****3 Credits**

Analysis of the allocation of resources in the field of health and medical care.

**ECON 449. Open Economy Macroeconomics****3 Credits**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.

**Prerequisite(s):** FIN 341 OR ECON 311.

**ECON 450. International Economics****3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450

**Prerequisite(s):** ECON 251G and ECON 252G.

**ECON 457. Mathematical Economics****3 Credits**

Application of mathematical tools, especially the calculus, to economic theory.

**Prerequisite:** one upper-division economics course.

**ECON 489. Senior Economics Seminar****3 Credits**

Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics.

**Prerequisite(s):** ECON 311 or ECON 312.

**ECON 490. Selected Topics****1-3 Credits**

Current topics in economics. Subject matter to be designated for each semester.

**ECON 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.

**Prerequisite:** junior or above standing and consent of instructor.

**ECON 503. Managerial Economics****3 Credits**

Theory and application of microeconomics to the management of organizations.

**Prerequisite(s):** A ST 251G or 311 or equivalent with B or better.

**ECON 545. Econometrics II****3 Credits**

Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

**Prerequisite(s):** ECON 251G, ECON 252G, STAT 251G or A ST 311, and AEEC 540.

**ECON 550. Special Topics****1-3 Credits**

Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

**ECON 571. Regulatory Policy and Industry Analysis: Electricity I**  
**3 Credits**

Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Prerequisite(s): .

**ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas**  
**3 Credits**

Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

**ECON 573. Regulatory Policy and Industry Analysis: Electricity II**  
**3 Credits**

Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.

**Prerequisite(s):** ECON 571 or consent of instructor.

**ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis**  
**3 Credits**

Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.

**Prerequisite(s):** ECON 571 or consent of instructor.

**ECON 581. International Economics**  
**3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations.

**Prerequisite(s):** ECON 311 and ECON 312.

**ECON 582. Economics of Health Care**  
**3 Credits**

Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.

**ECON 596. Independent Study**  
**3 Credits**

Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

## EDLT-EDUCATION (EDLT)

**EDLT 268. Integrating Technology with Teaching**  
**3 Credits**

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

**EDLT 368. Integrating Technology with Teaching**  
**3 Credits**

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

**Prerequisite:** EDUC 168 or previous computer experience.

**EDLT 520. Critical Digital Literacy**  
**3 Credits**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Pre/

**Prerequisite(s)/Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 522. Technology and Language Learning**  
**3 Credits**

Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. May be repeated up to 3 credits.

**EDLT 528. Foundations of Learning Design & Technology**  
**3 Credits**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Pre/

**Prerequisite(s)/Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 529. Developing and Managing Educational Networks**  
**3 Credits**

For educators who plan to manage technology resources in schools. Focus on operating systems, network capabilities and management, connections and transfer of files between different computer platforms and managing peripheral devices. Prerequisite(s)/  
**Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 560. Fostering Online Learning Communities**  
**3 Credits**

Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.

**EDLT 561. Social Media in Blended and Online Learning Environments**  
**3 Credits**

This course will explore the role of social media in online and blended learning environments through practical hands-on activities, critical dialogue, and collaborative projects which will prepare you to utilize social media personally and pedagogically.

**EDLT 572. Emerging Models for Learning Design and Technology**  
**3 Credits**

Applies instructional strategy development supported by technology for classroom curriculum.

**EDLT 573. Culturally Responsive Teaching with Technology****3 Credits**

Use of inquiry and problem-based learning supported by computer-based applications. Critical analysis of multiple forms of electronic media.

**Prerequisite(s)/Corequisite(s):** EDUC 518 or consent of instructor.

**EDLT 574. Technology Planning and Grant Writing****3 Credits**

Application of principles of curriculum development to the integration of technology to improve educational programs. How to develop technology plans, assess current uses of technology, write grants to acquire technology, improve the management of existing and future learning resources, and develop staff development strategies in technology.

**EDLT 575. Designing and Organizing Online Learning Environments****3 Credits**

Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings.

**EDLT 577. Online Teaching and Learning****3 Credits**

This course provides a survey of theories, models and methods used to design and delivery online education through the use of technologies in K-12, higher education, business/industry, and continuing education.

**EDLT 578. Design and Delivery of Webconferences and Webinars****3 Credits**

This course provides hands-on experiences with web conferencing and examines the theory and research of webconferencing's impact on teaching and learning.

**EDLT 579. Universal Design in Online Course Design****3 Credits**

Examines theory, practical application of strategies, and global and policy implications of universal design (UD) in online learning environments.

**EDLT 580. Tools and Techniques for Online Teaching****3 Credits**

Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience.

**EDLT 581. Emerging Technology Tools and Techniques****3 Credits**

This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning.

**EDLT 590. Assessing and Evaluating Online Learning****3 Credits**

Explores a variety of online assessment and evaluation options with an emphasis on continual assessment and evaluation to improve teaching and learning.

**EDLT 592. Directed Studies****3 Credits**

Supervised academic work. Consent of Instructor required.

**EDLT 607. Current Research in Learning and Technology****3 Credits**

Explores models and methods for examining and researching the impact of technology on learning and education.

**EDLT 610. Technology, Society, and Education****3 Credits**

Same as EDUC 610.

**EDLT 612. Advanced Fieldwork****3 Credits**

Fieldwork in learning technologies provides opportunities to integrate theory and practice through research, teaching and/or development.

**EDLT 620. Multimedia, Authoring and Curriculum Design****3 Credits**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Includes additional theoretical research component for doctoral students.

**EDLT 628. Designing Educational Resources for the Internet****3 Credits**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Includes a theoretical and research component for doctoral students.

**EDLT 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, ECED 633, EDUC 633, RDG, 633. Consent of Instructor required.

**EDLT 672. Emerging Models for Learning Design & Technology****3 Credits**

Integration of technology into content areas. May be repeated up to 3 credits.

**EDLT 673. Literacy and Technology****3 Credits**

Same as RDG 673, BIL 673.

**EDLT 677. Online Teaching and Learning****3 Credits**

This course provides a survey of theories; models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. Topics covered include accreditation, assessment, culturally responsive course design, current trends and best practices, hybrid and blended learning, learning management systems, online support services, social justice issues in online education, learner engagement, and retention. Crosslisted with: EDLT 577.

## EDUC-EDUCATION (EDUC)

**EDUC 101. Freshman Orientation****1 Credit**

Introduction to the university and to the College of Education. Discussion of planning for individualized education program and field experience. Restricted to Las Cruces campus only.

**EDUC 102. Internship I****3 Credits**

Supervised experience in elementary education settings.

**EDUC 103. Introduction with Internship in Bilingual Education/ESL****3 Credits**

An overview of the American Education system with emphasis on organization, governance, law, demographics, and professional practice. Will include supervised experience in bilingual education/ESL elementary settings for prospective bilingual education/ESL teachers.

**EDUC 150. Math for Paraprofessionals****3 Credits**

Applied math skills for paraprofessionals working with children.

**Prerequisite:** CCDM 103.

**EDUC 151. Math for Paraprofessionals II****3 Credits**

Applied math skills for paraprofessionals working under the direction of a teacher.

**Prerequisite:** EDUC 150.

**EDUC 181. Field Experience I****1 Credit**

Introduction to public school teaching, school visits, classroom observations and discussion seminar.

**EDUC 195. Individual Topics in Education****1-3 Credits**

Supervised study in a specific area of interest. Each course shall be designated by a qualifying subtitle. May be repeated for a maximum of 9 credits.

**EDUC 202. Internship II****3 Credits**

Supervised experience in junior high settings.

**Prerequisite:** must be a co-op student.

**EDUC 204. Foundations of Bilingual/ESL Education****3 Credits**

Explore and review the historical, legal, philosophical, theoretical and pedagogical paradigms of bilingual/ESL education.

**EDUC 219. Pre-Teacher Preparation****3 Credits**

Assists students in developing the necessary competencies needed for acceptance to the Teacher Education Program. Course content includes basic skill development, test taking skills, and completion of teacher preparation packet. Maybe repeated for a maximum of 6 credits. Graded S/U. Community Colleges only.

**EDUC 250. Introduction to Education****2 Credits**

An overview of the American education system with emphasis on organization, governance, law, demographics, and professional practice. Restricted to Las Cruces campus only.

**EDUC 281. Introduction to Secondary Education and Youth****3 Credits**

Introductory course for students considering a career in secondary education. Includes historical, philosophical, and sociological foundations, program organization, critical dispositions, and understanding the context of schools and youth. Practicum required. Restricted to: Secondary Ed majors. Traditional Grading with RR.

**EDUC 302. Internship III****3 Credits**

Student teaching in public school classroom according to major area of interest.

**EDUC 303. Secondary Bilingual/ESL Field Experience****3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Same as EDUC 381. Crosslisted with: EDUC 381.

**EDUC 315. Multicultural Education****3 Credits (2+2P)**

The conceptual manifestations of culture, race and ethnicity, class, gender, sexual orientation, exceptionalities, language, bilingualism, and global citizenship within the schooling process. May be repeated up to 3 credits. Crosslisted with: EDUC 317V.

**EDUC 317V. Multicultural Issues in Society****3 Credits**

Conceptual manifestations of culture, race, ethnicity, class, gender, exceptionalities, language, and bilingualism within and across society. Crosslisted with: EDUC 315.

**EDUC 342. Sheltered English Instruction for the ESL Classroom****3 Credits**

Addresses the acquisition of English proficiency by speakers of other languages.

**EDUC 343. Language, Literacy, and Culture in the ESL Classrooms****3 Credits**

Framework and strategies for developing the written abilities of second language learners.

**EDUC 344. Issues in Schooling for Bilingual Learners****3 Credits**

Current thought and direction regarding bilingual education in the United States and New Mexico.

**EDUC 381. Secondary Field Experience****3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Same as EDUC 303. Crosslisted with: EDUC 303.

**EDUC 395. Special Topics in Education****1-3 Credits**

Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 cr. per semester and a total of 6 credits overall.

**EDUC 402. Internship IV****6 Credits**

Supervised co-teaching in educational setting according to major area of interest.

**Prerequisite:** must be a co-op student.

**EDUC 451. Methods of Teaching Elementary School Science****3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**Prerequisite(s):** 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department.

**EDUC 452. Methods of Teaching Elementary School Mathematics****3 Credits (2+2P)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**Prerequisite(s):** MATH 111.

**EDUC 454. Methods of Teaching Elementary School Social Studies  
3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**EDUC 460. Teaching Language Arts at the Middle and High School Level  
3 Credits (2+2P)**

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 560. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 461. Teaching Social Studies at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Same as EDUC 561. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 462. Teaching Mathematics at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Same as EDUC 562. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 463. Teaching Science at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Same as EDUC 563. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 464. Teaching Foreign Language at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in foreign language. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of foreign language for students in grades 6-12. Practicum required. Same as EDUC 564.

**EDUC 470. Elementary Student Teaching  
9 Credits (9)**

Synthesis of knowledge and skills appropriate to teaching in elementary schools. May be repeated up to 9 credits. Restricted to: TEP-EED majors. S/U Grading (S/U, Audit).

**EDUC 471. Secondary Student Teaching  
9 Credits (9)**

Synthesis of knowledge and skills appropriate to teaching in secondary schools. May be repeated up to 9 credits. Restricted to: TEP-SED majors. S/U Grading (S/U, Audit).

**EDUC 475. Contemporary Issues in Education  
3 Credits (2+2P)**

Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. Requires field experience component in a school or community setting. Same as EDUC 575. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 480. International Student Teaching Seminar  
1 Credit**

Preparation for students planning to teach in an international setting. **Prerequisite:** Must be scheduled one semester before graduation.

**EDUC 481. Elementary Student Teaching Seminar  
3 Credits (3)**

Discussion of elementary school issues related to student teaching. Taken concurrently with EDUC 470. May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**EDUC 482. Middle and High School Student Teaching Seminar  
3 Credits (3)**

Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 471. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**EDUC 483. Second Language Acquisition  
3 Credits**

Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. Same as EDUC 583.

**EDUC 487. Methods of TESOL  
3 Credits**

Effective second language teaching approaches that provide for interactive learning situations, meaningful input language models, varied language use materials, adaptive teacher response strategies, and assessments of student processing needs.

**EDUC 489. Topics  
1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: TEP-SPED majors.

**EDUC 495. Directed Study Courses in Education  
1-3 Credits**

Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits.

**EDUC 501. Special Topics  
1-3 Credits**

Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.

**EDUC 504. Adult and Family Literacy in TESOL  
3 Credits**

An exploration of the theoretical, programmatic, and curricular frameworks for English language learners and their families. Focus on the development of culturally responsive and pedagogically sound literacy programs. Same as RDG 504.

**EDUC 505. Classroom Management****3 Credits**

Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations.

**EDUC 509. Teaching Methods Laboratory****3 Credits**

Practical application of previously learned content.

**Prerequisite(s):** Bachelors degree and admission to the Graduate School and departmental special program.

**EDUC 510. Internship/Student Teaching****6 Credits**

Integrated with EDUC 509. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary. Graded S/U.

**Prerequisite:** EDUC 509.

**EDUC 515. Multicultural Education****3 Credits (2+2P)**

Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Same as EDUC 315 with differentiated assignments for graduate students.

**EDUC 516. Curriculum and Pedagogy I****3 Credits**

Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings.

**EDUC 518. Technology and Pedagogy****3 Credits**

Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities. May be repeated up to 3 credits.

**Prerequisite(s):** Graduate standing.

**EDUC 519. Research in Curriculum and Pedagogy****3 Credits**

An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research.

**EDUC 520. Action Research Projects****3 Credits**

Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency.

**Prerequisite(s):** EDUC 515, 516, 518 & 519.

**EDUC 530. Exploration in Education****3 Credits (2+2P)**

Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.

**EDUC 537. Independent Readings****1-3 Credits**

Each project will be designated by a qualifying subtitle.

**EDUC 550. Methods of Teaching Early Childhood Education****3 Credits**

Characteristics of the young child, play, guidance, communication, methods, materials, models, issues. Same as EDUC 450 with differentiated assignments for graduate students.

**EDUC 551. Methods of Teaching Elementary School Science****3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Same as EDUC 451 with differentiated assignments for graduate students.

**Prerequisites:** 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department.

**Corequisites:** ECED 550, EDUC 552, and RDG 560 (block A course).

**EDUC 552. Methods of Teaching Elementary School Mathematics****3 Credits (2+2P)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Same as EDUC 452 with differentiated assignments for graduate students.

**Prerequisite:** MATH 111.

**Corequisites:** ECED 550, EDUC 551, and RDG 560 (block A course).

**EDUC 553. Methods of Teaching Elementary School Language Arts****3 Credits (2+2P)**

Implications of language acquisition and development for instructional practices. Focus on student-centered response to literature, writing process, whole language learning, based on socio-psycholinguistic theory and research. Same as EDUC 453 with differentiated assignments for graduate students.

**Corequisites:** EDUC 554, EDUC 555, and RDG 561 (block B course).

**EDUC 554. Methods of Teaching Elementary School Social Studies****3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Same as EDUC 454 with differentiated assignments for graduate students.

**Corequisites:** EDUC 553, EDUC 555, and RDG 561 (block B course).

**EDUC 557. Science and Math Methods: Internship****3 Credits**

Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction for mathematics and science. University supervision provided simultaneously with EDUC 557. Restricted to CI and HSS non-degree students.

**EDUC 558. Social Studies/Language Arts Methods Internship****3 Credits**

Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 558. Restricted to CI and HSS non-degree students.

**EDUC 560. Teaching Language Arts at the Middle and High School Level****3 Credits (2+2P)**

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 460 with differentiated assignments for graduate students. Prerequisite(s): TEP required EDUC 515 & EDUC 530.

**EDUC 561. Teaching Social Studies at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 461 with differentiated assignments for graduate students. Prerequisite(s): TEP required EDUC 515 & EDUC 530.

**EDUC 562. Teaching Mathematics at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as 462 with differentiated assignments for graduate students.

**Prerequisite(s):** TEP required EDUC 515 & EDUC 530.

**EDUC 563. Teaching Science at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students.

**Prerequisite(s):** TEP required EDUC 515 & EDUC 530.

**EDUC 567. Teaching Business Education at the Middle and High School Level  
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in business education. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of business education for student in grades 6-12. Practicum required. Same as EDUC 467 with differentiated assignments for graduate students.

**Prerequisite(s):** TEP required EDUC 515 & EDUC 530.

**EDUC 575. Contemporary Issues in Education  
3 Credits (2+2P)**

Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. The class will require a field experience component in a school or community setting. Taught with EDUC 475 with differentiated assignments for graduate students.

**EDUC 576. Qualitative Research  
3 Credits**

Introduction to qualitative research methodologies from problem formulation to interpretation of results.

**EDUC 583. Second Language Acquisition  
3 Credits**

Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. Appropriate for public school and adult educators. Same as EDUC 483.

**EDUC 587. Pedagogy of TESOL  
3 Credits**

Overview of approaches that provide for interactive, culturally responsive pedagogy for students acquiring English. Emphasis on development of ESL literacy. Appropriate for public school and adult educators. Same as RDG 587.

**EDUC 590. TESOL Practicum  
3 Credits**

Classroom applications of ESL literacy development through supervised teaching experiences accompanied by a seminar. Same as RDG 590.

**EDUC 595. Directed Study Courses in Education  
1-3 Credits**

Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall.

**EDUC 598. Special Research Programs  
1-3 Credits**

Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall.

**EDUC 599. Master's Thesis  
15 Credits**

Thesis.

**EDUC 600. Doctoral Research  
1-15 Credits**

Research.

**EDUC 601. Contemporary Curriculum/Instruction Practices  
1-3 Credits**

Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall.

**EDUC 602. Internship in Curriculum and Instruction  
3-6 Credits**

For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle.

**EDUC 603. Curriculum for a Diverse Society  
3 Credits**

Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings.

**EDUC 604. Pedagogy of Learning in a Diverse Society  
3 Credits**

Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning.

**EDUC 605. Independent Study Topics  
1-3 Credits**

A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes.

**EDUC 606. In-depth Interviewing: A Qualitative Research Method  
3 Credits**

Use of pilot research project to introduce students to in-depth interviewing techniques.

**EDUC 607. Current Research in Educational Practice  
3 Credits**

A seminar for doctoral and education specialist students emphasizing current research and educational practices. Same as BIL 607, ECED 607, RDG 607, and SPED 607.

**EDUC 608. Issues in Multicultural Curriculum and Instruction and Teacher Education  
3 Credits**

Builds upon multicultural theories and practices of teacher education. Restricted to doctoral-level students of any major.

**EDUC 613. Evaluation of Quantitative Research in Education****3 Credits**

A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. May be repeated up to 3 credits.

**EDUC 623. Curricular Mediation for Democratic Communities****3 Credits**

Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BIL 623, ECED 623.

**EDUC 630. Critical Race Theory & Storytelling in Educational Spaces****3 Credits**

An upper-level doctoral course focusing on the philosophical, theoretical, and methodological origins and practices of CRT and the sister frameworks that emerged from CRT, i.e., AsianCrit, BlackCrit, FemCrit, LatCrit, QueerCrit, TribalCrit, and WhiteCrit within educational spaces.

**EDUC 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, ECED 633, EDLT 633, RDG 633.

**EDUC 634. Research as Praxis****3 Credits**

Alternative community-or-school-based research aimed at investigating and transforming educational realities, with the participants for their own benefit. Students will experience the dynamic between research theory and practice in education. Crosslisted with: BIL 634, EDLT 634 and RDG 634. Restricted to: EDUC,C I,C ID majors.

**Prerequisite(s):** EDUC 576 and 613.

**EDUC 635. Critical Theory and Pedagogy****3 Credits**

Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BIL 635.

**EDUC 637. Social Justice Issues in Education****3 Credits**

Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BIL 637.

**EDUC 685. Practicum****2-6 Credits**

Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction.

**Prerequisite:** post-master's standing.

**EDUC 694. Dissertation Seminar: Qualitative Research Designs****1-6 Credits**

Dissertation seminar course for doctoral students utilizing a qualitative research design. Restricted to College of Education students.

**Prerequisite:** consent of instructor.

**EDUC 698. Selected Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 6 credits per semester and a total of 6 credits overall.

**EDUC 699. Ed.S. Thesis****1-15 Credits**

Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle.

**EDUC 700. Doctoral Dissertation****15 Credits**

Dissertation.

## ELA - EDUC LEADERSHIP & ADMIN (ELA)

**ELA 215. Multicultural Leadership in Education****3 Credits**

Introduction to the social and cultural constructions of gender, class, and race. Students will critically apply theoretical constructs to everyday life and discuss the intersection of gender and race with class inequality in national and global contexts. Using a social justice framework, readings, and assignments integrate a variety of racial/ethnic groups while considering the effects of historically uneven resource distribution, unearned privilege, forms of domination and subordination, immigration status, and cultural representation and ideologies. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection.

**ELA 255. Leadership and Change in Education****3 Credits**

This course will introduce students to the challenges and key strategies in initiating, implementing, and sustaining educational change and reform. In the first part of the course, participants will learn about the challenges of educational change in the United States and the role that they as school leaders play in facilitating change and reform. The course continues with an examination of how culture, micro-politics, and power structures support or impede national and global change initiatives. The last part of the course offers suggestions for change agents including community organizing, culture building, and embracing sustainable leadership practices. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection.

**ELA 298. Special Topics in Education****1-3 Credits (1-3)**

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.

Restricted to Las Cruces campus only.

**ELA 342. Current Issues In Educational Leadership****3 Credits**

This course addresses issues such as the rise in international education, education's costs, social media's role and influence, changes in state and national funding trends, student and faculty/staff diversity, among others. The focus of this course is centered on the actions and responses of administrators to the current issues they are facing.

**ELA 350V. Introduction to Educational Leadership in a Global Society****3 Credits**

Multinational educational systems covered through knowledge of the U.S. system of education promoting critical leadership roles every citizen plays in the success of educational systems.

**ELA 398. Special Topics in Education****1-3 Credits (1-3)**

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated for a maximum of 12 credits.

**ELA 411. Foundation for School Library Specialists****3 Credits**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELA 511. May be repeated up to 3 credits.

**ELA 412. Administration of the School Library****3 Credits**

Principles and practices related to the function, structure, and management of school libraries. Same as ELA 512. May be repeated up to 3 credits.

**ELA 413. Curriculum Role of the School Library Specialist****3 Credits**

Introduction to the integration of curriculum in school library programs. Current trends in collaborative planning and teaching between the school librarians and teachers. Taught with ELA 513. May be repeated up to 3 credits.

**ELA 414. Collection Management and Development in School Libraries****3 Credits**

Principles of identifying, selecting, acquiring, managing, and evaluating information for school libraries. Same as ELA 514. May be repeated up to 3 credits.

**ELA 440. Management of Student Services****3 Credits**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) for early entry level positions. This course will provide students with an examination of foundations and principals of student services. Important theories and essential competencies needed in order to be successful will be explored through a social justice perspective of leadership.

**ELA 450. Principles of Education Law and Policy****3 Credits**

Overview of the use of law and policy in schools and higher education. May be repeated up to 3 credits. Restricted to: E AD, majors.

**ELA 455. Principles of Education Budgeting and Finance****3 Credits**

Analysis of budget and finance practices in education. Restricted to: EMD majors.

**ELA 485. Elements of Research****3 Credits**

This course provides students with a foundation for understanding educational research. The course will also provide grounding in proper writing format for use in the education profession. Students will be introduced to various research paradigms and the symbiosis of theory and practice. Besides introducing students to the symbiosis of theory and practice, students will complete assignments and activities that demonstrate the use of that symbiosis. Ultimately, students will be able to use the knowledge they gain through the course to be able to critique educational research.

**ELA 499. Internship****3 Credits**

The undergraduate Educational Leadership major requires that students complete two internships. Internships provide students with either experience working in an area of administration that is different from the student's regular job or experience conducting research for a program or project. Each internship placement site and scope of work is determined through consultation with the course instructor. Students must complete 120 hours of work with the selected internship site. May be repeated up to 6 credits. Restricted to: EL majors.

**Prerequisite(s):** Student must be an EL major and be within (at least) one year of graduation.

**ELA 502. Special Problems.****1-3 Credits**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits. Consent of Instructor required.

**ELA 511. Foundation for School Library Specialists****3 Credits**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELA 411. May be repeated up to 3 credits.

**ELA 512. Administration of the School Library****3 Credits**

Principles and practices related to the function, structure, and management of school libraries. Same as ELA 412. May be repeated up to 3 credits.

**ELA 513. Curriculum Role of the School Library Specialist****3 Credits**

Introduction to the integration of curriculum in school library programs. Current trends in collaborative planning and teaching between school librarians and teachers. Same as ELA 413. May be repeated up to 3 credits.

**ELA 514. Collection Management and Development in School Libraries****3 Credits**

Principles of identifying, selecting, acquiring, managing, and evaluating information for school libraries. Same as ELA 414. May be repeated up to 3 credits.

**ELA 530. Management of Educational Change****3 Credits**

Leadership in implementing innovations in education. Consent of Instructor required.

**ELA 531. Special Education Administration****3 Credits**

Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards. Consent of Instructor required.

**ELA 540. Management of Student Services in Higher Education****3 Credits**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services. Consent of Instructor required.

**ELA 550. Higher Education Law****3 Credits**

This course is designed to review the impact of the legal process and the judiciary on higher education. Consent of Instructor required.

**ELA 555. Higher Education Finance and Funding****3 Credits**

This course examines the impact and process of financing and funding higher education. Consent of Instructor required.

**ELA 563. Higher Education Administration****3 Credits**

This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. Consent of Instructor required.

**ELA 564. Internship Public Schools Part I****3 Credits**

First half of a practical internship in Pk-12 schools under supervision of school administrator. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** 18 cr. of ELA coursework, 3 years of Pk-12 teaching experience and consent of instructor.

**ELA 565. Internship: Public Schools Part II****3 Credits**

Second half of a practical internship in Pk-12 administrative setting under supervision of experienced higher education administrator. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** ELA 564.

**ELA 566. Internship: Higher Education Part I****3 Credits**

First half of practical internship in administrative setting under supervision of experienced higher education administrator. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** 15 credits of ELA coursework and consent of instructor.

**ELA 567. Internship: Higher Education Part II****3 Credits**

Second half of a practical internship in an administrative setting under supervision of an experienced higher education administrator. Consent of Instructor required. Restricted to: E AD majors.

**Prerequisite(s):** ELA 566.

**ELA 568. Topics in School Administration****1-3 Credits**

Designated by subtitle.

**ELA 569. Basing Decision on Data: Higher Education.****3 Credits**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. Consent of Instructor required.

**ELA 570. Educational Leadership, Supervision, and Evaluation****3 Credits**

Leadership, supervision, and evaluation in Pk-12 and post secondary education. Consent of Instructor required.

**ELA 572. History and Philosophy of Education****3 Credits**

An overview of the historical development of the American school system and the relation of various philosophies to American education.

**ELA 575. The Principalship****3 Credits**

Key issues surrounding the role of school-site leaders. Consent of Instructor required.

**ELA 576. Educational Financial Management****3 Credits**

Educational finance and business applications. Consent of Instructor required.

**ELA 578. Leadership and Administration of Bilingual Education****3 Credits**

Concepts and practical approaches to improving the education of English languages learners through higher education. Consent of Instructor required.

**ELA 579. Public School Law****3 Credits**

Legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required.

**ELA 580. Administration of Adult and Continuing Education****3 Credits**

Administration of programs in public schools, higher education, community and nontraditional educational settings. Consent of Instructor required.

**ELA 582. Community College Administration****3 Credits**

An overview of the history, role, objectives and patterns governing the effectiveness of the community college. Consent of Instructor required.

**ELA 585. Elements of Research****3 Credits**

Survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required.

**ELA 586. Multicultural Leadership in Education****3 Credits**

Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. Consent of Instructor required.

**ELA 589. Evaluation Design in Education****3 Credits**

This course focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required.

**ELA 590. Basing Decision on Data: Pk-12****3 Credits**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. May be repeated up to 3 credits. Consent of Instructor required.

**ELA 595. Current Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits.

**ELA 598. Independent Studies****1-3 Credits**

Individual investigation in special topic areas. Requires prior approval of project advisor.

**ELA 600. Doctoral Research****1-15 Credits**

Research. S/U to traditional grade options. May be repeated up to 88 credits. Consent of Instructor required. Thesis/Dissertation Grading.

**ELA 620. Doctoral Seminar****1-3 Credits**

A study of current issues in educational administration at the national, state, and local levels. May be repeated up to 6 credits. Consent of Instructor required.

**ELA 622. Quantitative Research I****3 Credits**

Explores quantitative research methods, the rationale and assumptions that guide statistical decisions, beginning level statistical analyses, and how all of these are applied in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ELA 623. Qualitative Research I****3 Credits**

Explores qualitative research methods and models and their application in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**ELA 630. Concepts of Leadership in Education****3 Credits**

Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. May be repeated up to 3 credits. Consent of Instructor required.

**ELA 635. Scholarly Writing and the Southwest Border****3 Credits**

This course is designed to provide doctoral-level students with an opportunity to engage with scholarly and academic writing in a meaningful manner. Scholarly writing and academic writing are often used interchangeably. They will be used in that manner for this course. Generally defined, academic writing refers to a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise. Scholarly writing is the specific genre of writing that is used in all academic fields. For this course, the scholarly writing is contained to the context of the Southwest Border and Borderland issues. This is designed in consideration of and relates to the Department and Program's mission, which takes into account social justice and border education issues. Additionally, the course will cover topics associated with scholarly writing that include, but not limited to: formal language, tone, precision, clarity, word choice, and assumptive statements versus research-supported rationale. Consent of Instructor required. Restricted to: E AD majors.

**ELA 645. The Professoriate****3 Credits**

The purpose of this course is to explore the body of scholarly knowledge and research appropriate for the study of American higher education, the context in which teaching and learning occurs, and faculty's roles in the process. We will discuss the number, variety, and purpose of the various types of institutions; the different roles that faculty members play within these institutions; how faculty work is assessed and valued within the outside of the university; administrative regulations related to faculty work; current issues related to the general state of the professoriate; as well as how does one prepare to enter the professoriate.

**ELA 650. Higher Education Law****3 Credits**

This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. Consent of Instructor required.

**ELA 655. Higher Education Finance and Funding****3 Credits**

This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. Consent of Instructor required.

**ELA 670. Advanced Internship****1-6 Credits**

For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E AD majors. S/U Grading (S/U, Audit).

**ELA 671. Foundations of Educational Administration****3 Credits**

Advanced course about the political, economic, and social forces on policy making and governance of Pk-12 and postsecondary education. May be repeated up to 3 credits. Consent of Instructor required.

**ELA 676. Educational Financial Management****3 Credits**

This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. Consent of Instructor required.

**ELA 679. Public School Law****3 Credits**

Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required.

**ELA 682. Quantitative Research II****3 Credits**

Intermediate quantitative methods of research, statistical analyses, and their application in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Doctoral students only.

**Prerequisite(s):** ELA 622.

**ELA 683. Qualitative Research II****3 Credits**

Advanced qualitative methods of research and implementation in the field of educational leadership. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** ELA 623.

**ELA 685. Elements of Research****3 Credits**

Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required.

**ELA 689. Evaluation Design in Education****3 Credits**

Advanced course that focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required.

**ELA 693. Dissertation Seminar****3 Credits**

Same as BIL, C EP, ECED, EDUC, RDG, SPED 693. Consent of Instructor required.

**ELA 698. Selected Topics****1-6 Credits**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits per semester and overall total: May be repeated up to 9 credits.

**ELA 700. Doctoral Dissertation****9 Credits**

Dissertation. Minimum of 3 credits per regular semester. May be taken for a maximum of 36 credits. Consent of instructor required.

## ELT - ELECTRONICS TECHNOLOGY (ELT)

**ELT 103. Math Study Skills for Electronics****1 Credit**

Covers specific math study skills and critical thinking processes to reinforce practical applications of math and its use with electronics. The student will be introduced to electronic mathematical formulas during the problem-solving steps required for circuit analysis. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** E T 183 OR E T 184. Restricted to Community Colleges only.

**ELT 105. Basic Electricity and Electronics****3 Credits (2+2P)**

Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated circuits and other solid state devices, computers, fiber optics, and industrial application topics. Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 111

**ELT 110. Electronics I****4 Credits (3+3P)**

Fundamentals of electronics including: components, schematics, Ohm's law, Thevenin's and Norton's theorems, and series/parallel circuits incorporating passive, active and magnetic elements. Introduction to AC circuits. Crosslisted with: AERT123. Restricted to: Community Colleges only.

**ELT 120. Mathematics for Electronics****4 Credits**

Includes fundamental mathematics, algebra, sine, cosine, and other elementary functions as they specifically apply to the operation, manipulation, and evaluation of direct current (DC) and alternating current (AC) circuits. Minimum math proficiency of CCDM 114 required or math placement into MATH 120 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 124

**ELT 135. Electronics II****4 Credits (3+3P)**

Analysis of AC circuits, filters, and resonance. Introduction to solid state fundamentals including diodes and rectifier circuits, voltage regulators, various transistors and transistor characteristics, amplification and amplifiers, photoelectric effects, gates and timing circuits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** ELT 110 and ELT 120.

**ELT 155. Electronics CAD and PCB Design****3 Credits (2+2P)**

Introduction to and the use of commercially available CAD software covering schematic representation of electronic components and circuits. Printed circuit board layout techniques including proper schematic capture, netlist generation, design rule checking and manual routing covered.

**ELT 160. Digital Electronics I****4 Credits (3+3P)**

Number systems, codes, Boolean algebra, logic gates, Karnaugh maps, combination circuits, flip-flops, and digital troubleshooting techniques. Restricted to: Community Colleges only.

**Prerequisite(s):** ELT 110 and (ELT 120 or MATH 120).

**ELT 175. Soldering Practices****3 Credits (2+2P)**

Methods and techniques of hand soldering in the production of high quality and reliable soldering connections. Restricted to: Community Colleges only.

**ELT 205. Semiconductor Devices****4 Credits (3+3P)**

Analysis and trouble shooting of linear electronic circuits including amplifiers, op-amps, power supplies, and oscillators. Restricted to: Community Colleges only.

**Prerequisite(s):** ELT 110 and ELT 135.

**ELT 215. Microprocessor Applications I****4 Credits (3+2P)**

Fundamentals of microprocessor architecture and assembly language with an emphasis on hardware interfacing applications.

**Prerequisite(s)/Corequisite(s):** ELT 235. Prerequisite(s): ELT 160.

Restricted to: Community Colleges only.

**ELT 220. Electronic Communication Systems****4 Credits (3+2P)**

Principles and applications of circuits and devices used in the transmission, reception, and processing of RF, microwave, digital and telecommunications systems.

**Prerequisite(s)/Corequisite(s):** ELT 205. Prerequisite(s): ELT 135.

Restricted to: Community Colleges only.

**ELT 221. Cooperative Experience I****1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

**Prerequisite:** consent of instructor.

**ELT 222. Cooperative Experience II****1-6 Credits**

Continuation of ELT 221. Maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**ELT 225. Computer Applications for Technicians****3 Credits (2+2P)**

An overview of computer hardware, software applications, operating systems, high level programming languages and networking systems.

**ELT 230. Microprocessor Applications II****4 Credits (3+2P)**

Advanced microprocessor interfacing techniques. Topics in A/D and D/A conversion, I/O port address decoding, direct memory accessing, and peripheral device interfacing applications.

**Prerequisite:** ELT 215.

**ELT 235. Digital Electronics II****3 Credits (2+2P)**

Sequential logic circuits, latches, counters, shift-registers, fault analysis and troubleshooting of digital IC s, multiplexers, timers, encoders/decoders, arithmetic circuits, pulse shaping, and memory devices.

Restricted to: Community Colleges only.

**Prerequisite(s):** ELT 160.

**ELT 240. Introduction to Photonics****4 Credits (3+2P)**

Nature of light, light emitters, lasers, detectors, fiber optics communications systems, and other applications of light to electronics.

**Prerequisite:** ELT 135 or consent of instructor.

**ELT 250. Electronics Systems Analysis****2 Credits (1+3P)**

Capstone course emphasizing a systems approach to troubleshooting and maintaining complex electronics systems. Includes program review in preparation for technician certification.

**Prerequisite:** consent of instructor.

**ELT 260. Instrumentation Control and Signal Conditioning****4 Credits (3+2P)**

Introduction to sensors and transducers, signal conditioning and transmission for measuring and process control systems. Includes AD, DA converter, small servos and actuators. Prerequisite:ELT 205.

**ELT 265. Special Topics****1-6 Credits**

Topic to be announced in the Schedule of Classes.

**ELT 270. Biomedical Equipment Instrumentation****4 Credits (3+2P)**

Principles and applications of electronic circuits and devices used in biomedical equipment. Skills taught to include evaluating, troubleshooting and repairing various types of medical equipment.

**Prerequisite(s)/Corequisite(s):** ELT 260. Prerequisite(s): ELT 205.

Restricted to: Community Colleges only.

**ELT 295. Professional Development/Leadership****1 Credit**

As members and/or officers of student professional organizations, electronics technology students gain experience in leadership, team building, and community services. May be repeated for a maximum of 6 credit. Restricted to ELT and ET E majors.

## ENGL-ENGLISH (ENGL)

**ENGL 111 M. Rhetoric and Composition for International and Multilingual Students****4 Credits**

For international and multilingual students. Students will build on your prior knowledge of writing in English as a second or additional language by engaging in several genres of writing and reading, including reading responses, discussion posts, formal academic papers (Rhetorical Analysis and Documented Argument), and peer review. Your instructor and classmates will serve as your readers and will give you helpful and constructive criticism, which will in turn assist you in becoming a more fluent and engaging communicator in English. Fulfills English 111 Gen-ed requirement. Restricted to Las Cruces campus only.

**Prerequisite(s):** CBT/PB score of 500, or IBT score of 61, or SPCD 110, or consent of instructor.

**ENGL 111G. Rhetoric and Composition****4 Credits**

Skills and methods used in writing university-level essays.

**Prerequisite(s):** ACT standard score in English of 16 or higher or a Compass score 76 or higher; for those scoring 13-15 in English on the ACT or 35-75 on the Compass, successful completion of a developmental writing course; for those scoring 12 or below on the ACT standard score in English or 34 or below on the Compass, successful completion of two developmental writing courses.

**ENGL 111GH. Rhetoric and Composition Honors****4 Credits**

Individualized assignments and independent study. Satisfies 4 credits of General Education English Composition requirement.

**Prerequisite:** ACT standard English score of 25 or higher and departmental approval.

**ENGL 112. Rhetoric and Composition II****2 Credits**

A continuation of English 111G for those desiring more work in composition. Weekly themes based on outside reading.

**Prerequisite:** successful completion of ENGL 111G or the equivalent.

**ENGL 115G. Perspectives on Literature****3 Credits**

Examines literature by writers from culturally diverse backgrounds and from different cultural and historical contexts. Explores various strategies of critical reading.

**ENGL 116G. Perspectives on Film****3 Credits (3+3P)**

Explores narrative and documentary film and examines significant developments in the history of cinema. Criticism of film as an art form, technical enterprise, business venture, and cultural phenomenon.

**ENGL 203G. Business and Professional Communication****3 Credits**

Effective writing for courses and careers in business, law, government, and other professions. Strategies for researching and writing correspondence and reports, with an emphasis on understanding and responding to a variety of communication tasks with a strong purpose, clear organization, and vigorous professional style. May be repeated up to 3 credits.

**Prerequisite(s):** Grade of C- or better in ENGL 111G or SPCD 111G or ENGL 111 M.

**ENGL 211G. Writing in the Humanities and Social Sciences****3 Credits**

Theory and practice in interpreting texts from various disciplines in the humanities and social sciences. Strategies for researching, evaluating, constructing, and writing researched arguments. Course subtitled in the Schedule of Classes. May be repeated up to 3 credits.

**Prerequisite(s):** Grade of C- or better in ENGL 111G or ENGL 111M.

**ENGL 218G. Technical and Scientific Communication****3 Credits**

Effective writing for courses and careers in sciences, engineering, and agriculture. Strategies for understanding and presenting technical information for various purposes to various audiences. May be repeated up to 3 credits.

**Prerequisite(s):** Grade of C- or better in ENGL 111G or ENGL 111M.

**ENGL 220G. Introduction to Creative Writing****3 Credits**

Examines classic and contemporary literature in three genres. Various forms, terminologies, methods and technical aspects of each genre, and the art and processes of creative writing. May be repeated up to 3 credits.

**Prerequisite(s):** ENGL 111G or SPCD 111G or ENGL 111 M.

**ENGL 232. Script Development and Storyboarding****3 Credits**

Examines effective writing principles for creating storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Crosslisted with: CMI 232.

**ENGL 235. Narrative: Principles of Story Across the Media****3 Credits**

Examines the various strategies of written and visual storytelling, narrative structure and its principal components (plot, theme, character, imagery, symbolism, point of view) with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc. Crosslisted with: CMI 235

**ENGL 243. The Bible as Literature****3 Credits**

Develops informed readings of Hebrew and Christian scriptures. Emphasizes understanding Biblical literary forms, techniques, themes; historical, cultural contexts for interpretation; authorship, composition, audience for individual books; development of Biblical canon.

**ENGL 244G. Literature and Culture****3 Credits**

Intensive reading of and discussion and writing about selected masterpieces of world literature. Emphasizes cultural and historical contexts of readings to help students appreciate literary traditions. Core texts include works by Homer, Dante, and Shakespeare, a classic novel, an important non-Western work, and modern literature.

**ENGL 251. Survey of American Literature I****3 Credits**

From the colonial period to the transcendentalists.

**ENGL 252. Survey of American Literature II****3 Credits**

From Whitman to the present.

**ENGL 263. History of Argument****3 Credits**

Investigates the major figures and movements in rhetoric from the classical period to modern rhetorical theory, examining relations between rhetorical teaching and practice, culture, epistemology, and ideology.

Main campus only.

**Prerequisite(s):** ENGL 111G.

**ENGL 271. Survey of English Literature I****3 Credits**

From Beowulf through the eighteenth century.

**ENGL 272. Survey of English Literature II****3 Credits**

From the pre-Romantics to the present.

**ENGL 299. Special Topics****1-3 Credits**

Emphasis on a literary and/or writing subject chosen for the semester. Repeatable for a unlimited credit under different subtitles.

**ENGL 301. Theory and Criticism: Rhetoric and Culture****3 Credits**

Introduction to rhetorical criticism with an emphasis on understanding the theoretical and cultural underpinnings for the rhetorical analyses of texts.

**ENGL 302. Theory and Criticism: Literature and Culture****3 Credits**

Introduction to literary criticism, from its classical beginnings through contemporary critical approaches.

**ENGL 303. Theory and Criticism: Film, Media and Culture****3 Credits**

Surveys classical and contemporary film theory. Explores the relationship of theory to textual analysis and filmmaking practices. Includes auteurism semiotics, psychoanalysis, and other theories, as well as theories of other media.

**ENGL 304. Creative Writing: Prose****3 Credits**

Imaginative writing, chiefly prose narrative. Repeatable for a maximum of 9 credits.

**ENGL 305. Creative Writing: Reading Series****1 Credit**

A one credit class based on the English Department's literary reading series. The class meets online and at the literary readings.

**ENGL 306. Creative Writing: Poetry****3 Credits**

Introduction to the writing of poetry. Repeatable for a total of 9 credits.

**ENGL 307. Creative Writing: Creative Nonfiction****3 Credits**

Introduction to creative nonfiction. Skills emphasized will include the personal voice, powers of observation and reflection, advocacy, argument, and a creative, powerful use of language. Repeatable for a maximum of 9 credits.

**ENGL 308. Creative Writing: Playwriting****3 Credits**

Technique of one-act playwriting, and analysis of dramatic structure.

Crosslisted with: THTR 308

**ENGL 309. Screenwriting I****3 Credits**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Consent of instructor required. Crosslisted with: CMI 309 and THTR 306

**Prerequisite(s):** ENGL 235 or CMI 235.

**ENGL 310. Critical Writing****3 Credits**

A course in critical reading, writing, and research designed to prepare English majors for upper-division courses.

**ENGL 311G. Advanced Composition****3 Credits**

Writing of nonfiction prose. Reviews principles of expository and descriptive writing. Emphasizes the argument/persuasion essay with detailed discussion of semantic and rhetorical techniques.

**Prerequisite:** junior or senior standing, or consent of instructor.

**ENGL 315. Writing for the Web****3 Credits**

Introduction to writing for the World Wide Web through practical application and analysis on both theory and research. Allows hands-on learning in a computer classroom.

**ENGL 318G. Advanced Technical and Professional Communication****3 Credits**

Theory and practice of writing in technical and professional fields, individualized to each student's field. Emphasizes efficient writing processes and effective written products.

**Prerequisite:** junior or above standing, or consent of instructor.

**ENGL 321V. Modern European Drama****3 Credits**

Masterworks of European drama from the late 18th century to present. Crosslisted with: THTR 321V

**ENGL 322. Dramatic Character****3 Credits**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. Crosslisted with: THTR 322.

**ENGL 323. American Drama****3 Credits**

Masterworks of American drama by noted American playwrights. Crosslisted with: THTR 323

**ENGL 326. Cultural Identity and Representation Across the Media****3 Credits**

Considers complex relationships between representation and culture including how images and language shape racial, ethnic, gender, sexual, and class identities. Examines theories from several disciplines. Includes lecture, discussion and production exercises.

**ENGL 327V. Shakespeare around the Globe****3 Credits**

Introduction to multicultural issues in Shakespeare's plays and to adaptations of Shakespeare's plays in other cultures.

**ENGL 328V. Literature of Science Fiction and Fantasy****3 Credits**

Survey and critical examination of the development of science fiction and fantasy as literature genres through selected authors and texts.

**ENGL 329. Studies in Drama****3 Credits**

Emphasis on a group of related works of European or American drama; topics will vary. Crosslisted with: THTR 329 and CMI 329

**ENGL 330V. Studies in Poetry****3 Credits**

Emphasis on a related group of poems or on the work of one or more poets; topics will vary.

**ENGL 335V. Studies in the Novel****3 Credits**

Intensive reading of, discussion of, and writing about selected major novels from around the world. Emphasizes the history of the novel and its role in culture.

**ENGL 336. Studies in Film****3 Credits (3+3P)**

Explores the conventions of cinematic representation; the strategies involved in writing about and reading film; and/or the adaptation of literary texts to film. Repeatable under different subtitles.

**ENGL 339V. Chicana/o Literature****3 Credits**

Introduction to Chicano novels, short stories and selected creative nonfiction.

**ENGL 341V. American Indian Literature****3 Credits**

Forms and themes of Native American oral literary traditions; Native American writing in English, especially novels, short fiction, and poetry.

**ENGL 349. The Short Story****3 Credits**

Development of the short story as a distinct form. Readings and critical analysis of representative nineteenth and twentieth century pieces.

**ENGL 354. Form and Technique in Fiction****3 Credits**

Literature course designed for fiction writers, especially those English majors in the Creative Writing emphasis. The course combines the study of published fiction with the study of craft. Some of the assignments will require the student to write original fiction based on exercises provided by the instructor. Repeatable for up to 9 credits.

**ENGL 356. Form and Technique in Poetry****3 Credits**

Literature course designed for poets, especially those English majors in the Creative Writing emphasis. The course combines the study of published poetry with the study of craft. Some of the assignments will require the student to write original poems based on exercises provided by the instructor. Repeatable for up to 9 credits.

**ENGL 358. Form and Technique in Playwriting****3 Credits**

Literature course designed for playwrights, especially those English majors in the Creative Writing emphasis. The course combines the study of published plays and performances with the study of craft. Some of the assignments will require the student to write original plays based on exercises provided by the instructor. Repeatable up to 9 credits.

**ENGL 363. Literature for Children and Young Adults****3 Credits**

A comparative, historical survey of literature for young (K to 12th grade) readers. Emphasis on critical evaluation.

**Prerequisite:** junior or above standing.

**ENGL 380V. Women Writers****3 Credits**

Introduction to multicultural women's traditions through intensive study of works by women writers. Crosslisted with: W S 380V.

**ENGL 392V. Mythology****3 Credits**

Greek and Roman mythology and its impact on European and English literature. Readings in myths, classical plays, and other literature with mythological interest, including nonclassical myths.

**ENGL 394V. Southwestern Literature****3 Credits**

Introduction to multicultural literature of the Southwest: oral folk literature, literary fiction (classic and contemporary), nonfiction and poetry.

**ENGL 399. Special Topics****3 Credits**

Emphasis on a theme, genre, figure, or technique chosen for study during the semester. Repeatable under different subtitles.

**ENGL 400. Independent Study: Upper Division****1-3 Credits**

For students with demonstrated aptitude for independent work. Approval of instructor required before registration. Repeatable under different subtitles.

**ENGL 405. Chaucer****3 Credits**

Principal works, with emphasis on *The Canterbury Tales*.

**ENGL 407. Milton****3 Credits**

Studies in Milton's works.

**ENGL 408. Shakespeare I****3 Credits**

Principal plays of Shakespeare's first two periods. Crosslisted with: THTR 408.

**ENGL 409. Shakespeare II****3 Credits**

Principal plays of Shakespeare's last two periods. Crosslisted with: THTR 409.

**ENGL 412. Writing in the Workplace****3 Credits**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

**ENGL 413. Advanced Creative Writing: Prose Workshop****3 Credits**

Imaginative writing, chiefly the narrative. May be repeated up to 12 credits.

**Prerequisite(s):** ENGL 304 or consent of instructor.

**ENGL 414. Advanced Creative Writing: Poetry Workshop****3 Credits**

For advanced writers of poetry. Repeatable for a total of 12 credits.

**Prerequisite(s):** ENGL 306 or consent of instructor.

**ENGL 415. Advanced Creative Writing: playwriting Workshop****3 Credits**

Technique of full-length playwriting, and analysis of dramatic structure. May be repeated up to 12 credits. Consent of Instructor required. Crosslisted with: THTR 309 and CMI 309.

**Prerequisite(s):** ENGL 308 or consent of instructor.

**ENGL 416. Approaches to Literature****3 Credits**

Understanding, appreciation, techniques of instruction in the high school.

**Prerequisite:** at least 6 credits in upper-division English courses.

**ENGL 417. Advanced Study in Critical Theory****3 Credits**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301-303, strongly recommended. Repeatable under different subtitles.

**ENGL 418. History of Rhetoric****3 Credits**

Investigation of crucial writings that have shaped Western attitudes towards and practice of rhetoric. Will examine key concepts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

**ENGL 419. Modern Rhetorical Theory****3 Credits**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the twentieth century.

**ENGL 421. Advanced Study in a Literary Period or Movement****3 Credits**

Close study of a historical or theoretical topic in a particular literary period or movement. Repeatable under different subtitles.

**ENGL 422. Advanced Study in a Literary Form or Genre****3 Credits**

Close study of a topic in a particular literary form or genre. May be repeated under different subtitles.

**ENGL 423. Advanced Study in a Major Author****3 Credits**

Close study of selected works by a major author. May be repeated under different subtitles.

**ENGL 424. Advanced Study in a Major Text****3 Credits**

Close study of a major text. Course subtitled in the Schedule of Classes. Repeatable under different subtitles.

**ENGL 425. Advanced Study in Comparative Literature****3 Credits**

Close study of a selection of non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Repeatable under different subtitles.

**ENGL 427. Advanced Study in Film and Digital Media****3 Credits**

Offers close study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester. Repeatable under different subtitles Crosslisted with: ENGL 527.

**ENGL 429. British Romanticism****3 Credits**

Intensive study of major writers and critical topics from the Romantic period. Repeatable under different subtitles.

**ENGL 430. Online Publishing****3 Credits**

This three-credit course provides a theoretical background for online publishing and design as well as hands on experience publishing an online arts magazine.

**ENGL 431. Technical Editing****3 Credits**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

**ENGL 432. Gothic Literature****3 Credits**

Intensive study of gothic literature in particular historical, aesthetic, cultural, or intellectual contexts, such as American Gothic, Female Gothic, Dark Romanticism, or Vampire Literature. Repeatable under different subtitles.

**ENGL 433. Victorian Literature****3 Credits**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

**ENGL 438. Literature of the American Renaissance****3 Credits**

Intensive study of topics critical to the development of nineteenth century American literature before and during the Civil War, and the work of authors such as Emerson, Thoreau, Poe, Hawthorne, Melville, Whitman and Dickinson. Repeatable once under a different subtitle.

**ENGL 442. Modern and Contemporary American Poetry****3 Credits**

Studies the development of American poetry from World War I to the present. Repeatable once under a different subtitle.

**ENGL 444. Modern British Fiction****3 Credits**

Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable once under a different subtitle.

**ENGL 445. Postmodern Fiction****3 Credits**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable once under a different subtitle.

**ENGL 446. Advanced Creative Writing: Nonfiction Prose****3 Credits**

This workshop-format class for advanced writers will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 546. May be repeated up to 12 credits.

**Prerequisite(s):** ENGL 307 or consent of instructor.

**ENGL 449. Advanced Study in Writing****3 Credits**

Close study of a topic in composition, rhetoric and/or technical and professional communication. Repeatable for a maximum of 6 credits with permission of department.

**ENGL 451. Practicum in the Grammar of American English****3 Credits**

Studies of formal grammar of the English language in preparation for the teaching of the English language and/or advanced linguistic analysis.

**ENGL 452. History of the English Language****3 Credits**

This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

**ENGL 453. World Literatures****3 Credits**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable once under a different subtitle.

**ENGL 458. Latino/a Literature and Culture****3 Credits**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.

**ENGL 460. Proposal Writing****3 Credits**

Developing proposals and grants in a workshop setting.

**ENGL 462. Interdisciplinary, Client-Based Project Practicum****3 Credits**

Hands-on experience in designing projects within interdisciplinary teams for organizational clients. Taught with ENGL 562.

**ENGL 463. Advanced Study in English Literature****3 Credits**

Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

**ENGL 469. Advanced Study in American Literature****3 Credits**

Covers selected works for a particular period of American literary history. Repeatable under different subtitles.

**ENGL 470. Approaches to Composition****3 Credits**

Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.

**ENGL 478. Document Design****3 Credits**

Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.

**ENGL 479. Computers and Writing****3 Credits**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

**ENGL 480. Screenwriting II****3 Credits**

Students will write two short scripts, 10-15 pages each. Focus will be on learning how to take notes and rewrite. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialog, character development, etc. Crosslisted with: CMI 480

**Prerequisite(s):** ENGL 309 or CMI 309 or THTR 306 or consent of instructor.

**ENGL 481. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: W S 484

**ENGL 489. Cultural Studies: Literature and Theory****3 Credits**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable once under a different subtitle.

**ENGL 493. Middle English Textual Cultures****3 Credits**

Intensive study of cultures of reading, writing, and literary production in late-medieval England, situating Middle English literature in its manuscript contexts. No prior experience with Middle English required.

**ENGL 497. Internship****3-6 Credits (3-6)**

Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.

**ENGL 500. Supervised Study****1-3 Credits**

To prepare the student for the master's degree examinations by special studies in fields not covered in routine course work.

**Prerequisite:** consent of instructor.

**ENGL 501. Online Publishing****3 Credits**

This three-credit course provides a theoretical background for online publishing and design as well as hands-on experience publishing an online arts magazine. Taught with ENGL 430.

**ENGL 505. Graduate Study in Chaucer****3 Credits**

Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. May be repeated up to 3 credits.

**ENGL 508. Graduate Study in Shakespeare I****3 Credits**

Principal plays of Shakespeare's first two periods. Requirements include independent directed research.

**ENGL 509. Graduate Study in Shakespeare II****3 Credits**

Principal plays of Shakespeare's last two periods. Requirements include independent directed research.

**ENGL 510. Proseminar in Rhetoric and Professional Communication****3 Credits**

Introduction to research in rhetoric and professional communication. Taught with ENGL 610.

**ENGL 512. Graduate Study in Writing in the Workplace****3 Credits**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

**ENGL 513. Creative Writing Workshop: Fiction****3 Credits**

Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. May be repeated for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.

**ENGL 514. Creative Writing Workshop: Poetry****3 Credits**

Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.

**ENGL 516. Graduate Study in Approaches to Literature****3 Credits**

Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research.

**Prerequisite:** at least 6 credits in upper-division English courses.

**ENGL 517. Graduate Study in Critical Theory****3 Credits**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.

**ENGL 518. History of Rhetoric****3 Credits**

An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

**ENGL 519. Graduate Study in Modern Rhetorical Theory****3 Credits**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.

**ENGL 521. Graduate Study in a Literary Period or Movement****3 Credits**

Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 522. Graduate Study in a Literary Form or Genre****3 Credits**

Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 523. Graduate Study of a Major Author****3 Credits**

Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 524. Graduate Study in a Major Text****3 Credits**

Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.

**ENGL 525. Graduate Study in Comparative Literature****3 Credits**

Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Repeatable under different subtitles.

**Prerequisite:** graduate standing or consent of instructor.

**ENGL 526. Special Topics in Critical Theory****3 Credits**

Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.

**ENGL 527. Graduate Study in Film and Digital Media****3 Credits**

Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.

**ENGL 529. British Romanticism****3 Credits**

Intensive study of major writers and critical topics from the Romantic period. Repeatable under different subtitles.

**ENGL 530. Argument Theory and Practice****3 Credits**

Examining theories of argument and how language convinces audiences to think and act in certain ways and not in others. Investigates argument across disciplines and in social/political contexts.

**ENGL 531. Technical Editing****3 Credits**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

**ENGL 532. Gothic Literature****3 Credits**

Intensive study of gothic literature in particular historical, aesthetic, cultural, or intellectual contexts, such as American Gothic, Female Gothic, Dark Romanticism, or Vampire Literature. Repeatable under different subtitles.

**ENGL 533. Victorian Literature****3 Credits**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

**ENGL 534. Graduate Study: Form and Technique in Fiction****3 Credits**

Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.

**ENGL 535. Graduate Study: Form and Technique in Poetry****3 Credits**

Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 12 credits.

**ENGL 536. The Borderlands Writing Project****3-6 Credits (3-6)**

Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536

**ENGL 538. Antebellum American Literature****3 Credits**

Intensive study of topics critical to the development of nineteenth century American literature before and during the Civil War, and the work of authors such as Emerson, Thoreau, Poe, Hawthorne, Melville, Whitman and Dickinson. Repeatable once under a different subtitle. May be repeated up to 6 credits.

**ENGL 542. Modern and Contemporary American Poetry****3 Credits**

Studies the development of American poetry from World War I to the present. Repeatable once under a different subtitle.

**ENGL 543. Multimedia Theory and Production****3 Credits**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.

**ENGL 544. Modern British Fiction****3 Credits**

Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable once under a different subtitle.

**ENGL 545. Postmodern Fiction****3 Credits**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable once under a different subtitle.

**ENGL 546. Advanced Creative Writing: Nonfiction Prose****3 Credits**

This graduate-level workshop will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 446 with additional work required at the graduate level. Consent of Instructor required. Crosslisted with: ENGL 446.

**ENGL 548. Graduate Study in Empirical Research****3 Credits**

Introduction to empirical research methods in composition, professional communication, and rhetoric.

**ENGL 549. Graduate Study in Writing****3 Credits**

Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.

**ENGL 550. Graduate Study in Literacy****3 Credits**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.

**ENGL 551. Practicum in the Grammar of American English****3 Credits**

Studies of formal grammar of the English language in preparation for the teaching of the English language and/or advanced linguistic analysis. Taught with ENGL 451.

**ENGL 552. Graduate Study in History of the English Language****3 Credits**

This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

**ENGL 553. World Literatures****3 Credits**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable once under a different subtitle.

**ENGL 555. Graduate Study in Rhetoric of Scientific Literature****3 Credits**

Intensive study of the rhetoric of selected works of scientific literature.

**ENGL 558. Latino/a Literature and Culture****3 Credits**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.

**ENGL 559. Black Literature and Culture in the United States****3 Credits**

Focuses on established and emergent Black U.S. literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable once under a different subtitle.

**ENGL 560. Proposal and Grant Writing****3 Credits**

Developing proposals and grants in a workshop setting.

**ENGL 561. Topics in Writing Program Administration****3 Credits**

Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.

**ENGL 562. Interdisciplinary, Client-Based Project Practicum****3 Credits**

Hands-on experience in collaborating within interdisciplinary teams designing projects for organizational clients. Taught with ENGL 462.

**ENGL 563. Graduate Study in English Literature****3 Credits**

Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

**ENGL 564. History and Theory of Composition Studies****3 Credits**

Studies in the history and theory of composition as a discipline. Taught with ENGL 664.

**ENGL 565. Intercultural Rhetoric and Professional Communication****3 Credits**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.

**ENGL 567. Documentary Film Theory and Criticism****3 Credits (3+3P)**

Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

**ENGL 568. Rhetoric and Cultural Studies****3 Credits**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.

**ENGL 569. Graduate in American Literature****3 Credits**

A group of works from a particular period of American literary history. Repeatable under different subtitles.

**ENGL 570. Graduate Study in Approaches to Composition****3 Credits**

Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.

**ENGL 571. Composition Pedagogy and Practicum****3 Credits**

Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.

**ENGL 572. Technical-Professional Communication: Theory and Pedagogy****3 Credits**

Topics in teaching business, technical and scientific communication in academic and workplace contexts.

**Prerequisite:** graduate standing.

**ENGL 574. Workshop: Advanced Writing Prose****3 Credits**

Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

**ENGL 575. Workshop: Advanced Writing Poetry****3 Credits**

Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

**ENGL 576. Workshop: Advanced Writing Playwriting****3 Credits**

Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.

**ENGL 577. Workshop: Advanced Technical and Professional Writing****3 Credits**

Intensive practice in technical and professional writing and editing in a workshop environment. May be repeated for a total of 6 credits. Consent of instructor required.

**ENGL 578. Topics in Rhetoric and Technology****3 Credits**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.

**ENGL 579. Computers and Writing****3 Credits**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

**ENGL 580. Graduate Problems in Creative Writing****3 Credits**

Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.

**ENGL 581. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

Crosslisted with: W S 584

**ENGL 582. Gender and Popular Culture****3 Credits**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: W S 582

**ENGL 583. Critical Writing Studies****3 Credits**

Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.

**ENGL 584. Workshop: Advanced Academic Writing for International Students****3 Credits**

This workshop-based course is for graduate-level multilingual writers from all disciplines who want to improve their English academic writing in an intensive and collaborative environment. Students will propose a major writing project to workshop throughout the semester, such as dissertation, thesis, comprehensive exams, etc. Some of the topics covered will be academic language, cohesion/coherence, organization, and supporting academic arguments. Other topics to be determined by needs of the class. ) 4.Consent of instructor.

**Prerequisite(s):** 1.Be classified as a graduate student by the Graduate School 2.Be classified as an international student whose first language is not English 3.Have a major writing project in progress (comprehensive exams, thesis, dissertation, conference paper, etc.

**ENGL 585. Advanced Writing Workshop: RPC Capstone****3 Credits**

Students work to develop and revise their chosen Master's program Capstone Project (a portfolio, thesis or master essay) in consultation with instructor and classmates. Students provide and receive feedback on their work-in-progress. Consent of Instructor required.

**ENGL 589. Cultural Studies: Literature and Theory****3 Credits**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable once under a different subtitle.

**ENGL 590. Master's Seminar in Rhetoric****3 Credits**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.

**ENGL 591. Graduate Screenwriting****3 Credits**

Students will prepare a feature-length screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Aimed at preparing writers for the professional market. Consent of instructor required.

**ENGL 595. Master's Workshop: Poetry****3-6 Credits (3-6)**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

**Prerequisite(s):** Enrolled in MFA penultimate semester.

**ENGL 596. Master's Workshop: Fiction****3-6 Credits**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

**Prerequisite(s):** Enrolled in MFA penultimate semester.

**ENGL 597. Internship in Technical and Professional Communication****3-6 Credits (3-6)**

Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.

**ENGL 598. Master's Essay****3 Credits**

Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.

**ENGL 599. Master's Thesis****1-15 Credits**

Thesis.

**ENGL 600. Doctoral Research****1-15 Credits**

Assigns credit for research performed prior to the doctoral comprehensive examination.

**ENGL 601. Qualitative Research****3 Credits**

Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.

**ENGL 602. Quantitative Research****3 Credits**

Theory and practice of designing quantitative research studies and of collecting and analyzing data. Emphasis on quantitative methods of research in composition, professional communication, and rhetoric.

**ENGL 603. Rhetorical Criticism and Methodology****3 Credits**

Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on methods of rhetorical criticism.

**ENGL 604. Digital Research Methods****3 Credits**

This course will serve as one of the core methods courses in the RPC PhD program, focusing on “digital” methods in rhetorical studies. As such, the aim of this class is to help you begin to gain confidence in conducting research in rhetoric, professional communication, and composition using digital methods. In this course we will assume that digital methods in rhetoric take broadly two forms: first, digital methods of acquisition, processing, and presentation of research data. And second, digital methods of production and circulation of rhetorical objects. The former closely resembles the methods of “digital humanities” while the latter will be closer to media archaeology and “critical making” practices. In all cases, we will relate these tools and methods to key questions and theories in our field, asking how and why we might apply digital methods in rhetorical scholarship.

**Prerequisite(s):** graduate standing.

**ENGL 610. Proseminar in Rhetoric and Professional Communication****3 Credits**

Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.

**ENGL 643. Multimedia Theory and Production****3 Credits**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.

**ENGL 646. Teaching Rhetoric and Writing with English Language Learners****3 Credits**

This course introduces students to the rich interdisciplinary world of writing for English language learners with the goal of helping researchers and instructors understand the unique characteristics and needs of ELL writers. It also examines Generation 1.5, bilingualism, and Spanish-dominant writers along the U.S.-Mexico Border. The course prepares students to work with ELL writing in curriculum design, needs analysis, classroom implementation, assessment, writing program administration, and institutional policies. The course will be a requirement for those GAs seeking to teach experimental sections of first-year multilingual composition at NMSU.

**Prerequisite(s):** graduate standing.

**ENGL 649. Graduate Study in Writing****3 Credits**

Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.

**ENGL 650. Graduate Study in Literacy****3 Credits**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.

**ENGL 661. Topics in Writing Program Administration****3 Credits**

Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.

**ENGL 664. History and Theory of Composition Studies****3 Credits**

Studies in the history and theory of composition as a discipline. Taught with ENGL 564.

**ENGL 665. Intercultural Rhetoric and Professional Communication****3 Credits**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.

**ENGL 668. Rhetoric and Cultural Studies****3 Credits**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.

**ENGL 678. Topics in Rhetoric and Technology****3 Credits**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.

**ENGL 683. Critical Writing Studies****3 Credits**

This course investigates the field of Writing Studies as a distinct field of study, related to but not synonymous with Composition Studies. While debates surrounding the relationships among Writing Studies and Composition Studies flourish, this course centers on the former—investigating writing as a practice, process, and object that merits attention in its own right. Such attention will be grounded in contemporary critical and cultural theory that contests writing as a positive or neutral sign (i.e. activity theory, posthumanism, ecocriticism, new materialism, new media studies; feminist, queer, critical race or decolonial theory). Crosslisted with: ENGL 583.

**Prerequisite(s):** graduate standing.

**ENGL 690. Doctoral Seminar in Rhetoric****3 Credits**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.

**ENGL 700. Doctoral Dissertation****15 Credits**

Dissertation.

## ENGR-ENGINEERING (ENGR)

**ENGR 100. Introduction to Engineering****3 Credits (2+3P)**

An introduction to the various engineering disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities.

**Prerequisite(s)/Corequisite(s):** MATH 121G.

**ENGR 100H. Introduction to Engineering****3 Credits (2+3P)**

An introduction to the various engineering disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities. Pre/

**Corequisite(s):** MATH 190G.

**ENGR 111. Mathematics for Engineering Applications****3 Credits**

An introduction to engineering mathematics and basic programming skills needed to perform elementary data manipulation and analysis. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** MATH 190G. Prerequisite(s): MATH 121G.

**ENGR 198. Special Topics in Engineering****1-3 Credits**

Directed individual study of topics in engineering. Written reports covering work required. May be repeated for a maximum of 6 credits.

Restricted to engineering majors. Graded S/U.

**Prerequisite:** consent of academic dean.

**ENGR 398. Engineering Leadership Seminar****3 Credits (3)**

This course introduces students to concepts and skills related to leadership positions held at the University in the College of Engineering. The course will provide theory and practice in leadership; provide skills in effective oral communications and presentation, team building skills, and general knowledge of NMSU and the College of Engineering. May be repeated up to 18 credits. Consent of Instructor required.

**ENGR 401. Engineering Capstone I****3 Credits**

Seniors will work in teams to apply a systematic design process to real world multidisciplinary problems. Problems selected from a broad spectrum of interest areas, including environmental, mechanical, industrial design, electrical, and thermal/fluids. Students will utilize the knowledge and skills acquired in earlier course work, and incorporate appropriate engineering standards and multiple realistic constraints. Emphasis is placed on the design process, the technical aspects of the design, and the development of a prototype that meets design objectives.

## ENTR-ENTREPRENEURSHIP AND INNOVATION

**ENTR 331. Business Creation and Valuation****3 Credits**

The course is designed to provide a first look at the entrepreneurship process by focusing how the firm will/does create value in the marketplace. As such, it is designed to integrate knowledge of business functions and apply business analysis techniques to the valuation of new ventures/entrepreneurial firms.

**ENTR 332. Entrepreneurial Finance****3 Credits**

The course is structured to provide a parallel learning experience of financing methods/theory and project work focused on financing select start-up companies. Students will learn a broad range of early stage financing techniques. In addition to explorations in class of the theory of entrepreneurial finance students will hear actual young companies from different industries present their opportunities and challenges to the class.

**ENTR 333. Business Analysis and Turnaround****3 Credits**

This course provides students an opportunity to draw upon previous experiences and education to apply various business concepts and analytical tools to complex problems and issues in organizational settings. Business Analysis is an integrative course in two respects. First, it takes a broad view of the environment that includes competitive dynamics and macro-environmental trends and developments. Second, it takes the perspective of the firm as a whole and examines how each of the functional areas can be integrated into overall operational strategies to address the firm's key organizational issues and environmental challenges.

## ENVE-ENVIRONMENTAL ENGINEERING (ENVE)

**ENVE 450. Aquatic Chemistry****3 Credits**

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibrium solubility, buffering and redox conditions. Crosslisted with: ENVE 550.

**Prerequisite(s):** C E 256.

**ENVE 451. Unit Processes/Operation of Water Treatment****3 Credits**

Theory and applications with unit processes in environmental engineering. Physical and chemical treatment methods are emphasized. Crosslisted with: ENVE 551.

**Prerequisite(s):** C E 356.

**ENVE 452. Unit Processes/ Operation of Wastewater Treatment****3 Credits**

Theory and applications with unit processes in environmental engineering. Biological treatment methods are emphasized. Crosslisted with: ENVE 552.

**Prerequisite(s):** C E 356.

**ENVE 456. Environmental Engineering Design****3 Credits**

Design of chemical, physical and biological operations and processes involved in water and wastewater treatment.

**Prerequisite(s):** C E 356.

**ENVE 458. Urban Water-Energy-Environment Systems****3 Credits**

An introduction to environmentally sustainable solutions to water-energy nexus. This course integrates scientific principles, engineered processes, and systems analyses to address society's growing needs of water and renewable energy and their interconnections with environment.

**Prerequisite(s):** C E 256.

**ENVE 459. Environmental Microbiology****3 Credits**

An introduction to the diverse roles of microorganisms in natural and engineered environments. The topics include cellular architecture, energetics, and growth; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodegradation and bioremediation of contaminants.

**ENVE 462. Sampling and Analysis of Environmental Contaminants****3 Credits (1+6P)**

Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Same as E S 462.

**Prerequisites:** C E 256 and E S 256.

**ENVE 487. Air Pollution Control Systems Design****3 Credits**

An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of air pollution control equipment.

**Prerequisite(s):** Senior or graduate standing.

**ENVE 504. Advanced Environmental Engineering Design****3 Credits**

Advanced engineering design covering subject matter of Environmental Engineering capstone undergraduate design course plus an additional report or project. May be subtitled. Consent of Instructor required.

**ENVE 550. Aquatic Chemistry****3 Credits**

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 450.

**Prerequisite(s):** C E 256.

**ENVE 551. Unit Processes/Operation of Water Treatment****3 Credits**

Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 451. Restricted to: ENVE majors.

**Prerequisite(s):** C E 356.

**ENVE 552. Unit Processes/Operation of Wastewater Treatment****3 Credits**

Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 452. Restricted to: ENVE majors.

**Prerequisite(s):** Consent of instructor.

**ENVE 552 L. Unit Processes/Operation of Wastewater Treatment Laboratory****1 Credit**

Dry laboratory emphasizing design of common unit operations/processes in biological treatment. Restricted to majors.

**Prerequisite:** consent of instructor.

**Corequisite:** ENVE 552.

**ENVE 556. Advanced Water Treatment and Reuse****3 Credits**

Theoretical and practical aspects of advanced water technologies for water treatment and reuse. Consent of Instructor required.

**ENVE 557. Surface Water Quality Modeling****3 Credits**

Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Restricted to majors.

**ENVE 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to majors.

**ENVE 599. Master's Thesis****15 Credits**

Thesis. May be repeated for a maximum of 6 credits.

**ENVE 630. Fate and Transport of Environmental Contaminants****3 Credits**

Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** ENVE 557 and consent of instructor.

# EPWS-ETMLGY/PLNT PTHLGY/WD SCI (EPWS)

**EPWS 100. Applied Biology****3 Credits**

Introduction to applied biology and ecology focusing on insects, plants and pathogens in natural areas, crops and urban settings. EPWS 100L is strongly recommended to take in the same semester. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**EPWS 100 L. Applied Biology Lab****1 Credit**

Study of applied biology and ecology of insects, plants and pathogens in natural areas, crops, and urban settings. EPWS 100 strongly recommended to take in the same semester. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

**EPWS 200. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**EPWS 300. Special Topics****1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**EPWS 301. Agricultural Biotechnology****3 Credits (2+2P)**

The principles of molecular biology will be introduced and used to explore the past, present, and future applications of biotechnology in agriculture. Specific topics include methodologies for making transgenic plants with increased pest resistance, the use of biotechnology in pest detection, and improving nutritional value. The laboratory will provide students with hands-on experience with equipment used for biotechnology research.

**Prerequisites:** CHEM 112G, BIOL 111G, or BIOL 211G.

**EPWS 302. General Entomology****4 Credits**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

**Prerequisite(s):** BIOL 111G or 211G.

**EPWS 303. Economic Entomology****3 Credits (3+2P)**

Identification and life cycles of insects of economic significance, their relationship to humans and agriculture including biological interactions and controls. May be repeated up to 3 credits.

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 310. Plant Pathology****4 Credits (3+2P)**

Causes and methods of prevention and treatment of diseases in plants.

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 311. Introduction to Weed Science****4 Credits (3+2P)**

Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Crosslisted with: AGRO 311.

**Prerequisite(s):** CHEM 111G, and BIOL 211G.

**EPWS 314. Plant Physiology****3 Credits**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Same as BIOL 314.

**Prerequisites:** BIOL 211G, CHEM 112G.

**EPWS 325V. Insects, Humans, and the Environment****3 Credits**

Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present day, and future impacts in underdeveloped, developing, and developed civilizations.

**EPWS 373. Fungal Biology****3 Credits (2+2P)**

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 373.

**Prerequisites:** EPWS 310 or BIOL 311, or consent of instructor.

**EPWS 380V. Science & Society****3 Credits**

Analysis and evaluation of how human activities affect the earth's environment or ecosystems. Several examples, from global issues to local issues will be studied in detail. Current science and the intersection of science and public policy will be discussed in relation to problems like world population, agricultural productivity, deforestation, medical advances, and future prospects for the environment. May be repeated up to 3 credits.

**EPWS 390. Internship****1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**EPWS 420. Environmental Behavior of Pesticides****3 Credits**

Behavior of pesticide compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 211 recommended prior to course. May be repeated up to 3 credits.

**EPWS 447. Seminar****1 Credit**

Organization and techniques for the oral presentation of research information. Restricted to: Main campus only.

**EPWS 449. Special Problems****1-3 Credits**

Individual investigation in specific areas of entomology, plant pathology or plant physiology. Maximum of 3 credits per semester and a grand total of 6 credits.

**EPWS 451. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**Prerequisite:** consent of instructor.

**EPWS 455. Advanced Integrated Pest Management****3 Credits**

Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Crosslisted with: EPWS 505.

**Prerequisite(s):** Either EPWS 303 or EPWS 310 or EPWS 311, or consent of instructor.

**EPWS 456. Biological Control****3 Credits**

Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506.

**Prerequisite:** introductory course in entomology.

**EPWS 462. Parasitology****3 Credits**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.

**EPWS 462 L. Parasitology Lab****1 Credit**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife. May be repeated up to 1 credits.

**EPWS 471. Plant Mineral Nutrition****3 Credits**

Same as HORT 471 and AGRO 471.

**EPWS 475. Urban Entomology****3 Credits**

Identification and life cycles of insects in urban environments, their relationship to humans, agriculture, biological interactions and controls

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 481. Plant Nematology****3 Credits (2+2P)**

Biology, ecology and basic identification of soil-inhabiting nematodes, with emphasis on host-parasite relationships and management principles for plant-parasitic genera.

**EPWS 486. Plant Virology****3 Credits**

An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.

**EPWS 492. Diagnosing Plant Disorders****3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as AGRO 492 and HORT 492.

**Prerequisites:** EPWS 303, EPWS 310.

**EPWS 502. General Entomology****4 Credits**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

**Prerequisite(s):** BIOL 111G or BIOL 211G.

**EPWS 505. Advanced Integrated Pest Management****3 Credits**

Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Crosslisted with: EPWS 455.

**Prerequisite(s):** EPWS 303 or EPWS 310 or EPWS 311 or consent of instructor.

**EPWS 506. Biological Control****3 Credits**

Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. Credit cannot be given for both EPWS 456 and EPWS 506.

**Prerequisite:** introductory course in entomology.

**EPWS 511. Introduction to Weed Science (f)****4 Credits (3+2P)**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Crosslisted with: AGRO 511.

**Prerequisite(s):** CHEM 111G and BIOL 211G.

**EPWS 514. Plant Physiology****3 Credits**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development.

**Prerequisite(s):** BIOL 211G, CHEM 112G.

**EPWS 520. Environmental Behavior of Pesticides (so)****3 Credits**

Behavior of these compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 211 recommended prior to course. May be repeated up to 3 credits.

**EPWS 525. Scientific Writing- How to be a Productive and Effective Writing****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, HORT 525 and SOIL 525.

**EPWS 549. Special Problems****1-4 Credits**

Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.

**EPWS 551. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**EPWS 573. Fungal Biology****3 Credits (2+2P)**

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 573.

**Prerequisite:** EPWS 310 or consent of instructor.

**EPWS 575. Urban Entomology****3 Credits**

Identification and life cycles of insects in urban environments, their relationship to humans, agriculture, biological interactions and controls

**Prerequisite(s):** Either BIOL 111G or BIOL 211G.

**EPWS 590. Graduate Seminar****1 Credit**

Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree.

**EPWS 598. Graduate Internship****1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

**EPWS 599. Master's Thesis****15 Credits**

Thesis.

## FCS-FAMILY AND CHILD SCIENCE (FCS)

**FCS 181. Interpersonal Skills in Intimate Relationships****3 Credits**

Developing social skills within friendships, dating relationships, marriage, parenting, and families. May be repeated up to 3 credits. Restricted to Las Cruces and Dona Ana campuses.

**FCS 210. Infancy and Early Childhood in the Family****3 Credits**

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age five. Attitudes, knowledge, and skills needed for working with young children and their families. Restricted to Las Cruces campus only.

**FCS 211. Middle Childhood Development in the Family****3 Credits**

Research and theory relevant to the physical, mental, social, and emotional development of the child from age five to age twelve. Attitudes, knowledge, and skills related to working with school-age children in the family system. Observation in a variety of settings may be required. Restricted to Las Cruces campus only.

**FCS 212. Adolescent Development and the Family****3 Credits**

Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required. Restricted to Las Cruces campus only.

**FCS 213. Adult Development and Aging****3 Credits**

Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions. Restricted to Las Cruces campus only.

**FCS 300. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**FCS 301. Personal and Family Finance****3 Credits**

Principles, processes and procedures involved in effective utilization and management of financial resources to meet the needs of individuals and/or families. Open to nonmajors.

**FCS 302. Consumer Practices and Problems for Families****3 Credits**

Consumer issues related to social, political, and economic components of the larger social system. Focuses on consumer rights and responsibilities within the marketplace.

**FCS 380. Family Dynamics****3 Credits**

The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.

**FCS 383. Parenting and Child Guidance****3 Credits**

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

**FCS 424. Field Experience: Issues and Ethics****4 Credits**

Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 8 credits must be taken. Consent of instructor required.

Restricted to: Main campus only. Restricted to FCS majors.

**Prerequisite(s):** FCS 380 or equivalent, junior standing, and an overall GPA of at least 2.5 and consent of instructor.

**FCS 449V. Family Ethnicities and Subcultures****3 Credits**

Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students.

**FCS 492. Special Problems****1-4 Credits**

Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits.

**FCS 510. Infancy and Early Childhood in the Family****3 Credits**

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families. May be repeated up to 3 credits.

**FCS 511. Middle Childhood Development in the Family****3 Credits**

Research and theory relevant to the physical, mental, and socio-emotional development of children from ages five to twelve. Attitudes, knowledge, and skills needed for working with school-age children and their families. May be repeated up to 3 credits.

**FCS 512. Adolescent Development and the Family****3 Credits**

Advanced study in research and theory relevant to the physical, mental, social, and emotional development of the child, ages 12-18. Attitudes, knowledge, and skills related to working with adolescents in the family system. May be repeated up to 3 credits.

**FCS 524. Supervised Practicum****1-9 Credits**

Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**FCS 525. Supervised Clinical Practice****1-9 Credits (2-18P)**

Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

**FCS 548. Adult Development and Aging****3 Credits**

Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions.

**FCS 549. Family Ethnicities and Subcultures****3 Credits**

Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCS 449V plus additional work.

**FCS 562. The Business and Practice of Marriage and Family Therapy****1 Credit**

This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. S/U Grading (S/U, Audit).

**FCS 572. Family Dysfunction and Diagnosis****3 Credits**

A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.

**Prerequisite(s):** Students must be enrolled in a clinical program (i.e. MFT, CEP, MSW).

**FCS 582. Theories of Marriage and Family Therapy****2 Credits**

A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research. May be repeated up to 4 credits.

**FCS 583. Parenting and Child Guidance****3 Credits**

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

**FCS 584. Family Law and Ethics****3 Credits**

Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

**FCS 585. The Family System****3 Credits**

Contemporary family interaction: concepts, composition, resource and environment.

**FCS 586. Sexuality and Family Dynamics****3 Credits**

Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

**FCS 587. Contemporary Marriage and Family Issues****3 Credits**

Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

**FCS 589. Family Crises and Rehabilitation****3 Credits**

Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

**FCS 590. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

**FCS 592. Strategies in Family Therapy****2 Credits**

Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers. May be repeated up to 4 credits.

**FCS 598. Special Research Programs****1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**FCS 599. Master's Thesis****15 Credits**

Thesis

## FCSC-FAMILY & CONSUMER SCI (FCSC)

**FCSC 400. Research Methods in Family and Consumer Sciences****3 Credits**

Introduction to research design and methodology in Family and Consumer Sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and perform basic skills including hypotheses development and conducting a literature search.

**FCSC 500. Research Methods****3 Credits**

This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

**FCSC 598. Special Research Programs****1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**FCSC 599. Master's Thesis****15 Credits**

May be repeated for unlimited credit, maximum of 6 credits toward a degree.

## FCSE-FAMILY & CONSUMER SCI EDU (FCSE)

**FCSE 235. Housing and Interior Design****3 Credits**

Investigation of types of housing and factors impacting housing decisions for families. Selection, planning, and arrangement of interior components of homes to meet the needs of the family. Restricted to Las Cruces campus only.

**Prerequisite(s):** No prerequisites.

**FCSE 245. Overview of Family and Consumer Sciences Teaching****3 Credits**

Overview of planning and teaching skills. Supervised experiences in observing and directing the learning of secondary family and consumer sciences students. Philosophy and history of the profession.

**FCSE 345. Management Concepts in Family and Consumer Sciences Teaching****3 Credits**

Incorporation and application of management concepts in family and consumer sciences subject matter. Practical experience teaching management and ways to use management skills to plan, implement, and evaluate the teaching-learning transaction.

**FCSE 348. Teaching in Informal Family and Consumer Sciences Settings****3 Credits**

Learning principles and theories with application in informal family and consumer sciences education situations. Includes supervised experience in use of teaching strategies.

**Prerequisite:** overall GPA of at least 2.5 or consent of instructor.

**FCSE 445. Career and Technical Education Programs****3 Credits**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

**FCSE 446. Teaching Methods I for Family and Consumer Sciences****3 Credits**

Objectives, content, and organization of family and consumer sciences curriculum in high schools; materials and methods of teaching. Restricted to majors.

**Prerequisites:** FCSE 245 and FCSE 345 and an overall GPA of at least 2.5, or consent of instructor.

**FCSE 447. Teaching Methods II for Family and Consumer Sciences****3 Credits**

Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Preparation for employment. Restricted to majors.

**Prerequisites:** FCSE 245, FCSE 345, FCSE 445, FCSE 446 and an overall GPA of at least 2.5, or consent of instructor.

**FCSE 448. Supervised Teaching in Family and Consumer Sciences****12 Credits**

Seventy (70) days of full-time supervised teaching in selected high schools. Consent of Instructor required. Restricted to: FCSE majors.

**Prerequisite(s):** FCSE 446, an overall GPA of at least 2.5, and consent of instructor.

**FCSE 492. Special Problems****1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

**FCSE 545. Graduate Study in Vocational Programs for Youth and Adults**  
**3 Credits**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

**FCSE 546. Graduate Study in Teaching Methods I****3 Credits**

Objectives, content, and organization of family and consumer sciences in high schools; materials and methods of teaching. Additional assignments beyond FCSE 446 required for students registering in FCSE 546.

**FCSE 547. Graduate Study in Teaching Methods II****3 Credits**

Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Additional assignments beyond FCSE 447 required for students registering in FCSE 547.

**FCSE 548. Graduate Study in Supervised Teaching in Family and Consumer Sciences****12 Credits**

Seventy of full-time, supervised teaching in selected schools. Additional assignments beyond FCSE 448 required for students registering in FCSE 548. Consent of Instructor required.

**Prerequisite(s):** FCSE 446 or FCSE 546, and consent of instructor.

**FCSE 590. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

## FIN-FINANCE (FIN)

**FIN 206. Introduction to Finance****3 Credits**

Theory and techniques of financial management for business firms. Includes application of financial analysis tools and techniques needed for business financial administration and decision making. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 106 or higher; BOT 120 or ACCT 221; ECON 201 or ECON 251.

**FIN 210. Financial Planning and Investments****3 Credits**

Individual financial planning and related financial markets and institutions. Community Colleges only.

**FIN 303V. Personal Financial Planning and Investing in a Global Economy**  
**3 Credits**

Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.

**FIN 311. Financial Futures Markets****3 Credits**

Same as AG E 311.

**FIN 322. Principles of Insurance****3 Credits**

Theory and practice of insurance and its economics and social significance; review of the major lines of insurance including life, health, and property liability insurance.

**FIN 323. Life/Health/Employee Benefits****3 Credits**

Approaches to problems of employee security from the perspective of businesses. Topics including pensions, profit-sharing plans, 401(k) plans, group life and health plans, and flexible benefit programs. The course also addresses individual life, health, and annuity contracts within a financial planning context.

**Prerequisite:** FIN 322.

**FIN 324. Property and Liability Insurance****3 Credits**

Analysis of property and liability insurance with emphasis on handling of commercial exposures. Review of property and liability company operations including rate making and insurance accounting. **Prerequisite:** FIN 322

**FIN 325. Real Estate Principles and Law I****3 Credits**

Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BLAW 325.

**FIN 326. Business Risk Management****3 Credits**

The operational risks faced by firms and the study of various methods of handling these risks, including loss prevention, risk retention, self-insurance, corporate insurance programs, and capital markets. **Prerequisites:** FIN 322

**FIN 327. Analysis of the Excess and Surplus Lines Insurance****3 Credits**

Analysis of excess and surplus lines segment of the insurance industry, including ratemaking, pricing of insurance, regulation, marketing of insurance, reinsurance, and product development. Students groups will research and design a new insurance product as part of the class.

**FIN 341. Financial Analysis and Markets****3 Credits**

Financial analysis for business financing and investing decisions. **Prerequisites** ACCT 221, ECON 251, ECON 252, MATH 121G or 230, A ST 251 or A ST 311 or STAT 251G.

**FIN 355. Investments****3 Credits**

Analysis of investment risks and rewards and of the problems of portfolio selection and management. Operation of the securities market.

**Prerequisite(s):** FIN 341 with a grade of C- or better.

**FIN 360. Financial Information Technology****3 Credits**

Integrated use of electronic financial information resources with spreadsheet and word processing applications in investigating financial issues and solving financial problems. FIN 341 with a grade of C- or better.

**Prerequisite(s):** FIN 341 or consent of instructor.

**FIN 385. Analysis of Financial Markets and Institutions****3 Credits**

Analysis of the financial system, emphasizing its institutions and instruments.

**Prerequisite(s):** FIN 341 with a grade of C- or better.

**FIN 391. Finance Internship and Cooperative Education I****1-3 Credits**

Introduction and application of finance principles in a work environment. Open only to students in the finance major or minor who will be working with an approved employer in a finance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required.

**FIN 392. Insurance Internship and Cooperative Education I****1-3 Credits (1-3)**

Introduction and application of insurance principles in a work environment. Open only to students in the finance major or insurance minor who will be working with an approved employer in an insurance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required. Restricted to Finance majors.

**FIN 393. Banking Internship and Cooperative Education****1-3 Credits (1-3)**

Professional banking experience with opportunities to engage in business analysis and to observe application of business principles in the management of a banking entity or a regulatory agency with banking oversight. Open only to students in the finance major or banking minor who will be working with an approved employer in a banking related position, over a period of 12 weeks or at least 300 work hours. May be repeated up to 3 credits. Consent of Instructor required.

**FIN 406. Theory of Financial Decisions****3 Credits**

Contemporary financial theory. Firm valuation, investments and financing decisions, risk analysis.

**Prerequisite(s):** FIN 341 with a grade of C- or better.

**FIN 421. Personal Financial Planning for Professionals****3 Credits**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.

**Prerequisite(s):** FIN 341, or consent of Instructor.

**FIN 435. Investment Analysis****3 Credits**

Efficiency of capital markets, modern portfolio management, special topics of current interest to investment analysts.

**Prerequisite:** FIN 355.

**FIN 436. Applied Security Analysis and Portfolio Management****1-3 Credits (1-3)**

Application of analytical tools to security selection and portfolio management Pre/

**Corequisite(s):** FIN 435.

**FIN 445. Fixed Income Markets, Instruments and Derivatives****3 Credits**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored.

**Prerequisite(s):** FIN 341.

**FIN 455. Derivative Markets and Securities****3 Credits**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles.

**Prerequisite(s):** FIN 355.

**FIN 466. Financial Policy Decisions****3 Credits**

Application and integration of financial theory, concepts, and practice using the case method.

**Prerequisite:** FIN 406 or consent of instructor.

**FIN 470. Real Estate Appraisal****3 Credits (2+2P)**

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to student in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with: AG E 470.

**Prerequisite(s):** Junior or above standing.

**FIN 475. International Managerial Finance****3 Credits**

International aspects of financial transactions, decision-making, banking and financial markets. Same as I B 475.

**Prerequisite:** FIN 341.

**FIN 480. Management of Financial Institutions****3 Credits**

Asset and liability management of financial institutions; emphasis on commercial bank management.

**Prerequisite:** FIN 385 or consent of instructor.

**FIN 490. Selected Topics****1-3 Credits**

Current topics in finance.

**Prerequisites:** vary according to the seminar being offered.

**FIN 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisites:** junior or above standing and consent of instructor.

**FIN 500. Concepts in Finance****1 Credit**

An overview of fundamental principles of finance necessary for prospective MBA students who do not have an undergraduate background in finance. Includes: Time value of money concepts and calculations; risk and calculation of return given appropriate risk measures; bond risk characteristics and calculation of the value of a bond; calculation of the value of common stock (determination as to whether a stock is over-valued or under-valued); and calculation of the costs of capital and capital budgeting problems using the cost of capital.  
**Prerequisite(s):** admitted to MBA Program or consent of course department.

**FIN 503. Financial Management****3 Credits**

Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions.  
**Prerequisite(s):** FIN 341 with a grade of B or better.

**FIN 511. Financial Futures Markets****3 Credits**

Same as AEEC 511.

**FIN 521. Personal Financial Planning for Professionals****3 Credits**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.

**Prerequisite(s):** FIN 503 or FIN 341 or consent of Instructor.

**FIN 535. Investment Concepts****3 Credits**

Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management.

**Prerequisite(s):** FIN 355 or FIN 503.

**FIN 536. Applied Security Analysis and Portfolio Management****1-3 Credits (1-3)**

Application of analytical tools to security selection and portfolio management. Pre/

**Corequisite(s):** FIN 435 or FIN 535.

**FIN 545. Fixed Income Markets, Instruments and Derivatives****3 Credits**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Assignments and exams will be differentiated from the undergraduate cross-listed course. In addition, graduate students are expected to complete a project. Crosslisted with: FIN 445.

**FIN 555. Derivative Markets and Securities****3 Credits**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Same as FIN 455 with differentiated assignments for graduated students.

**Prerequisite(s):** FIN 503 or instructor permission.

**FIN 566. Advanced Financial Management****3 Credits**

Application and integration of financial theory, concepts, and practice using the case method.

**Prerequisite:** FIN 503.

**FIN 575. International Managerial Finance****3 Credits**

International aspects of financial transactions, decision-making, banking and financial markets.

**Prerequisite(s):** FIN 503 or FIN 341.

**FIN 581. Management of Financial Institutions****3 Credits**

Asset and liability management of financial institutions; emphasis on commercial bank management.

**Prerequisite(s):** FIN 385 or FIN 503.

**FIN 590. Selected Topics****1-3 Credits (1-3)**

Current topics in finance. Taught with FIN 490 with differentiated assignments for graduate students. Consent of instructor required.

**FIN 598. Special Research Programs****1-3 Credits**

Directed individual reading or research.

**Prerequisite:** consent of instructor.

## FIRE-FIRE INVESTIGATION (FIRE)

**FIRE 101. Firefighter I****8 Credits (6+6P)**

This course will train the student to the Firefighter I level as outlined in NFPA 1001, Standard for Firefighter Professional Qualifications. Firefighter I certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 8 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** OEEM 103 and FIRE 115. Restricted to Community Colleges campuses only.

**FIRE 102. Fire Fighter I and II****12 Credits**

This course will train the student as outlined in NFPA 1001, Fire Fighter Professional Qualifications. Firefighter I & II Certification issued through the New Mexico Firefighter's Training Academy (NMFTA) upon successful completion [International Fire Service Accreditation Congress (IFSAC) & Pro Board accredited]. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** FIRE 115, FIRE 252, OEEM 103. Restricted to Dona Ana campus only.

**FIRE 104. Firefighter II****8 Credits (6+6P)**

This course will train the student to the Firefighter II level as outlined in NFPA 1001, Standard for Firefighter Professional Qualifications. Firefighter II certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 8 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** FIRE 252. Prerequisite(s): FIRE 101. Restricted to Community Colleges campuses only.

**FIRE 112. Principles of Emergency Services****3 Credits**

This course provides an overview to fire protection and emergency services including career opportunities in fire protection and related fields. The organization and function of public and private fire protection services is studied including how fire departments fit as part of local government. An overview of laws and regulations affecting the fire service is explored along with specific fire protection functions and responsibilities including basic fire chemistry and physics, introduction to fire strategy and tactics and life safety initiatives. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**FIRE 114. Fire Behavior and Combustion****3 Credits**

This course explores the theories and fundamentals of how and why fires start, spread, and are controlled. Restricted to: Community colleges only.

**FIRE 115. Hazardous Materials Awareness and Operations****3 Credits**

This course will train the student to the Hazardous Materials Awareness and Operations level as outlined in NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents and OSHA 29 CFR 1910.120. Hazardous Materials Awareness and Operations certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**FIRE 120. Fire Protection Hydraulics and Water Supply****3 Credits**

This course will train students on requirements for becoming a safe and effective fire apparatus driver/operator. The focus will be on pump operation, construction, testing, and mathematical calculation required for effective pump operation and fire control. Responsibilities of the driver/operator will be taught and assessed consistent with applicable NFPA standards and the New Mexico Firefighters' Training Academy (NMFTA) guidelines. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the NMFTA. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** FIRE 128. Restricted to Community Colleges campuses only.

**FIRE 126. Fire Prevention****3 Credits**

This course will educate students about the principles and techniques of fire prevention and life-safety inspection and code compliance in accordance to NFPA 1031, Standard for Professional Qualifications for Fire Inspector and Plan Examiner, Level I. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the New Mexico Firefighters' Training Academy (NMFTA). Restricted to Community Colleges campuses only.

**FIRE 128. Apparatus and Equipment****2 Credits**

This course is a pre/co-requisite to FIRE 120. The course will train students on attitude and skill requirements for becoming a safe and effective fire apparatus driver/operator. The focus will be on apparatus inspection, operation, maintenance, and specification. Responsibilities of the driver/operator will be taught and assessed consistent with applicable NFPA standards and the New Mexico Firefighters' Training Academy (NMFTA) guidelines. Students pursuing certification must possess a current and valid New Mexico driver's license. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the NMFTA. Restricted to Community Colleges campuses only.

**FIRE 130. Principles of Fire and Emergency Services Safety and Survival****3 Credits**

This course introduces the basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavior change throughout the emergency services. Consent of instructor required. Restricted to: Community colleges only.

**FIRE 200. Special Topics****1-12 Credits (1-12)**

Specific subjects to be announced in the Schedule of Classes. Course may be repeated for credit as topics change. May be repeated up to 12 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**FIRE 201. Independent Study****1-3 Credits**

Research on an approved topic to meet graduation requirements. Meets or exceeds NFPA standards. May be repeated for total of 9 credits.

**Prerequisite:** consent of instructor.

**FIRE 202. Wildland Fire Control****1-3 Credits**

Focuses on factors affecting wildland fire control and prevention, fire behavior, control techniques, command structure and other operations including Standards for Survival I-100, S-130 and S-190 Meets or exceeds NWCG Training Curriculum and NFPA 1051 standards. Restricted to: Community Colleges Only.

**FIRE 203. Fire and Emergency Services Administration****3 Credits**

This course will provide students entry-level training in company operations and administration at the first-line supervisory level. The student will learn how to effectively manage human resources and community/public relations. Students will learn about fire department organization and administration; including budgets, reports, and planning. Students will learn the process involved in fire inspection, investigation, public education, emergency service delivery, and safety, per NFPA Standard 1021, Fire Officer Professional Qualifications. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**FIRE 210. Building Construction for Fire Protection****3 Credits**

This course provides the components of building construction related to firefighter and life safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies. Restricted to: Community colleges only.

**FIRE 220. Cooperative Experience I****1-3 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and rated by the employer and instructor. May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**FIRE 221. Cooperative Experience II****3 Credits**

Apply advanced firefighting knowledge and skills while working with fire protection agencies. Meets or exceeds NFPA standards. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.

**Prerequisite(s):** FIRE 220.

**FIRE 223. Fire Investigations I****3 Credits**

This course meets the requirements set forth in NFPA 1033 Professional Qualifications for Fire Investigator. This course will give a comprehensive understanding of the principles of fire investigation, scene examination, documentation, evidence collection/preservation, interview techniques, and post-incident investigations. Student who meet all course requirements are eligible for International Fire Service Accreditation Congress (IFSAC) certification through New Mexico Firefighters' Training Academy (NMFTA). Restricted to Community Colleges campuses only.

**FIRE 224. Strategy and Tactics****3 Credits**

Provides an in-depth analysis of the principles of fire control through utilization of personnel, equipment and extinguishing agents on the fire ground. Covers the development of systematic action plans for emergency situations. Includes recognizing and prioritizing emergency scene needs and developing related strategies, tactics and contingencies. Educates students on how resources should be deployed to implement those plans. Restricted to Community Colleges campuses only.

**FIRE 225. Fire Protection Systems****3 Credits**

This course provides information relating to the features and design and operation of fire alarm systems, water-based fire suppression systems, special hazard fire suppression systems, water supply for fire protection and portable fire extinguishers. Restricted to: Community colleges only.

**FIRE 226. Fire Investigations II****3 Credits**

This course is intended to provide the student with advanced technical knowledge on the rule of law, fire scene analysis, fire behavior, evidence collection and preservation, scene documentation, case preparation and court-room testimony. Restricted to: Community colleges only.

**FIRE 230. Fire Service Instructor****3 Credits**

Provides the instructor candidate with methods and techniques of instruction including oral communications, preparing lesson plans, writing performance objectives, use of audio and other training aids, and the selection, evaluation and preparation of performance tests. Meets and exceeds NFPA 1041 Level I standards. Restricted to: Community Colleges only.

**FIRE 232. Firefighter Internship****3 Credits**

Application of knowledge, skills and abilities in a fire service department, as a firefighter intern and integrated member of a fire affiliated agency. Restricted to majors.

**Prerequisites:** FIRE 101, FIRE 102, FIRE 115, FIRE 202 and EMT-B and consent of instructor.

**FIRE 233. Practical Approach to Terrorism****3 Credits**

Gives responder an overall safety approach in recognizing and responding to incidents involving terrorism. Presents an overview in types of harm, explosive weapons, chemical weapons, biological weapons and radiological weapons. Restricted to: Community Colleges only.

Crosslisted with: LAWE 233

**FIRE 252. Vehicle Extrication****2 Credits (1+2P)**

This course will train the student to the Vehicle & Machinery Extrication level I as outlined in NFPA 1006, Standard for Technical Rescuer Professional Qualifications. Vehicle & Machinery Extrication certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

## FREN-FRENCH (FREN)

**FREN 111. Elementary French I****4 Credits**

French language for beginners.

**FREN 112. Elementary French II****4 Credits**

French language for beginners.

**Prerequisite:** C or better in FREN 111.

**FREN 211. Intermediate French I****3 Credits**

Speaking, reading and writing.

**Prerequisite:** C or better in FREN 112.

**FREN 212. Intermediate French II****3 Credits**

Speaking, reading and writing.

**Prerequisite:** C or better in FREN 211.

**FREN 306. Topics in French Culture and Civilization****3 Credits**

Selected topics focusing on French culture and civilization. Topics identified in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**Prerequisite:** FREN 212 or consent of instructor.

**FREN 315. French Grammar****3 Credits**

A thorough review of French grammar through the study of grammatical elements and the use of grammatical exercises.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 325. Intermediate Conversation****3 Credits**

French conversation through intensive oral practice with emphasis on vocabulary acquisition and pronunciation.

**Prerequisite:** FREN 212 or consent of instructor.

**FREN 330. Business French****3 Credits**

An introduction to standard language within the corporate world in French-speaking countries. Students practice reading, writing, listening, speaking and expanding their vocabulary in professional fields related to business.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 341. Introduction to French Linguistics****3 Credits**

This course aims to introduce the basic concepts of contemporary linguistics and to show how the French language functions in regard to form and meaning.

**Prerequisite(s):** FREN 212.

**FREN 352. French Phonetics****3 Credits**

Systematic description of modern French pronunciation. Corrective exercises for foreign learners. Formal study of spelling/pronunciation relationships.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 360. French Cinema****3 Credits**

The evolution of contemporary French cinema. A critical understanding of film as an art form and as cultural expression.

**Prerequisite:** FREN 212 or consent of instructor.

**FREN 365V. Perspectives in French Culture****3 Credits**

Examines components of French culture through literature, films and other sources. Taught in English. Does not satisfy Arts and Sciences second language requirement. Does not satisfy French major or minor requirements.

**FREN 378. Studies in Francophone Cultures****3 Credits**

Studies of representative Francophone cultures through their history, literature, music and films.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 381. Survey of French Literature I****3 Credits**

Literary movements, authors and selected texts of the Middle Ages through the eighteenth century.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 382. Survey of French Literature II****3 Credits**

Literary movements, authors and selected texts of the nineteenth and twentieth centuries.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 385. French Civilization****3 Credits**

A detailed study of important events in French civilization from its origins to the twentieth century through the study and discussion of history, literature, fine arts and politics.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 386. Contemporary Women Writers in French****3 Credits**

Exploration of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 425. Advanced French Conversation****3 Credits**

Mastery of spoken French language through discussion of personal readings and group work to develop vocabulary, syntactical and conversational skills. The class is conducted entirely in French.

**Prerequisite(s):** FREN 325 or consent of instructor.

**FREN 449. Special Problems****1-3 Credits**

Directed reading for graduate students in specific field to satisfy language requirement for master's or doctoral programs.

**FREN 451. Special Topics in French****1-3 Credits**

Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**FREN 453. Independent Studies in French****1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**FREN 466. Introduction to French Linguistics****3 Credits**

This course aims to introduce the basic concepts of contemporary linguistics and to show the French language functions with regard to form and meaning. Consent of instructor required.

**Prerequisite(s):** Advanced level in French.

**FREN 471. The French Novel****3 Credits**

Development of the novel and analysis of selected texts with emphasis on the nineteenth and twentieth centuries.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 472. The French Short Story****3 Credits**

Study and discussion of French short stories through the ages.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 478. Studies in Francophone Cultures Around the World****3 Credits**

Advanced studies of representative Francophone cultures through their history, literature, music and films.

**Prerequisite(s):** FREN 212 or consent of instructor.

**FREN 486. Advanced Contemporary Women Writers in French****3 Credits**

Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

**Prerequisite(s):** FREN 212 or consent of instructor.

## FRMG-FAMILY RESOURCE MGT (FRMG)

**FRMG 450. Special Topics****1-4 Credits**

Special subjects and credits to be announced in the Schedule of Classes. May be taken for a maximum of 4 credits per semester and a total of 9 credits toward a degree.

**FRMG 492. Special Problems****1-4 Credits (1-4)**

Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of Instructor required.

**FRMG 590. Special Topics****1-4 Credits**

Special subjects and credits to be announced in the Schedule of Classes. May be taken for a maximum of 4 credits per semester and a total of 9 credits toward a degree.

## FSTE-FOOD SCIENCE & TECHNOLOGY (FSTE)

**FSTE 164G. Introduction to Food Science and Technology****4 Credits (3+2P)**

An introductory course in the scientific study of the nature and composition of foods and their behavior during all aspects of their conversion from raw materials to consumer food products.

**FSTE 175. ACES in the Hole Foods I****4 Credits**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products Restricted to Las Cruces campus only.

**Prerequisite(s):** Students enrolled in this class must possess A Food Handler Card.

**FSTE 200. Special Topics****1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**FSTE 210G. Survey of Food and Agricultural Issues****3 Credits**

Same as AG E 210G.

**FSTE 263G. Food Science I****4 Credits (3+2P)**

The scientific study of the principles involved in the preparation and evaluation of foods. May be repeated up to 4 credits.

**FSTE 275. ACES in the Hole Foods II****4 Credits**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. May be repeated up to 4 credits.

**Prerequisite(s):** FSTE 175 and Have a Food Handler Card.

**FSTE 320. Food Microbiology****4 Credits (3+2P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. May be repeated up to 4 credits.

**Prerequisite(s):** (BIOL 111G and BIOL 111GL), or (BIOL 211G and BIOL 211GL), or consent of instructor.

**FSTE 325. Food Analysis****3 Credits (2+2P)**

Basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 111G or consent of instructor.

**FSTE 328. Introduction to Food Engineering****3 Credits (2+2P)**

Basic engineering principles including mass and energy balances, fluid flow, heat transfer and chemical kinetics and their application to food processing unit operations. Video and laboratory participation are used to enhance course content and relevance. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 142G or consent of instructor.

**FSTE 331. Food Preservation****3 Credits (2+2P)**

Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. May be repeated up to 3 credits.

**Prerequisite(s):** FSTE 263G.

**FSTE 375. ACES in the Hole Foods III****4 Credits (2+8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products May be repeated up to 8 credits. Restricted to: FSTE majors.

**Prerequisite(s):** FSTE 275 and Have a Food Handler Card.

**FSTE 421. Food Chemistry****3 Credits**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing, and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods.

**Prerequisites:** CHEM 111G, CHEM 112G, and CHEM 211, or consent of instructor.

**FSTE 423. Food Processing Technologies****4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control.

Application of principles to processing food in a laboratory setting.

**Prerequisite(s):** FSTE 328.

**FSTE 425. Sensory Evaluation of Foods****3 Credits (2+2P)**

Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.

**Prerequisite(s):** FSTE 263G and A ST 311 or STAT 251.

**FSTE 429. Product Development****3 Credits (1+4P)**

Application of chemical, physical, nutritional and psychological principles and experimental methods to the development and evaluation of a food product for a specified food product development competition.

**Prerequisite(s):** FSTE 320 and FSTE 425.

**FSTE 430. Designing and Brewing Great Beers of the World****3 Credits (1+4P)**

The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class. May be repeated up to 3 credits.

**FSTE 450. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

**FSTE 475. ACES in the Hole Foods IV****1-4 Credits (2-8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. May be repeated up to 8 credits. Restricted to: FSTE majors.

**Prerequisite(s):** FSTE 375 Have a Food Handler Card.

**FSTE 492. Special Problems****1-4 Credits**

Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

**FSTE 500. Data Analysis for Food Scientists****3 Credits (3)**

An introduction to data analysis of food scientists. Modern statistical techniques used to analyze typical data collected by food scientists and researchers will be covered. Consent of Instructor required.

**FSTE 520. Graduate Study in Food Microbiology****3 Credits (2+3P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.

**Prerequisites:** BIOL 111G/111GL, or BIOL 211G/211GL, or consent of instructor.

**FSTE 521. Graduate Study in Food Chemistry****3 Credits**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.

**Prerequisites:** CHEM 111G, CHEM 112G, and CHEM 211, or consent of instructor.

**FSTE 523. Food Processing Technologies****4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting. Additional work beyond that for FSTE 423 required at the graduate level.

**Prerequisite(s):** FSTE 528.

**FSTE 524. Sensory Evaluation of Foods****3 Credits (2+3P)**

Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.

**Prerequisite(s):** FSTE 263G and A ST 311 or STAT 251.

**FSTE 525. Graduate Study in Food Analysis****3 Credits (2+3P)**

Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.

**Prerequisite(s):** CHEM 111G or consent of instructor.

**FSTE 532. Designing and Brewing Great Beers of the World****3 Credits (2+2P)**

The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

**FSTE 560. Rumen Microbiology (so)****3 Credits**

Same as ANSC 560.

**FSTE 575. ACES in the Hole Foods****1-4 Credits (2-8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. May be repeated up to 8 credits.

**Prerequisite(s):** Students must possess a food handler card.

**FSTE 598. Special Research Programs****1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

## **FWCE-FISH,WILDLF,CONSERV ECOL (FWCE)**

**FWCE 109. Contemporary Issues in Wildlife and Natural Resources Management****3 Credits**

Ecological, socioeconomic, and political issues surrounding the management of our natural resources with an emphasis on fish and wildlife resources.

**FWCE 110G. Introduction to Natural Resources Management****4 Credits (3+2P)**

This class covers historical and current issues affecting the management of renewable natural resources with an emphasis on water, soil, rangeland, forest, fish, and wildlife resources. An emphasis is placed on the scientific method and critical thinking. In the laboratory students collect and analyze field data on topics covered above and write up each unit as a laboratory report.

**FWCE 255. Principles of Fish and Wildlife Management****3 Credits**

Basic principles of fish and wildlife management including history, ecology, economics, and policy. Emphasis on wildlife and fisheries. Uses an ecosystem approach integrating living and nonliving resources.

**Prerequisite(s):** FWCE 110.

**FWCE 301. Wildlife Ecology****3 Credits**

General ecological theory with emphasis on concepts including biogeography, species interactions, population dynamics and disease ecology as they relate to the management and conservation of vertebrates.

**Prerequisite(s):** BIOL 111G or BIOL 190.

**FWCE 330. Natural History of the Vertebrates****4 Credits (3+3P)**

Evolution, ecology, and diversity of vertebrates. Topics include comparative anatomy and physiology, biogeography, community ecology, behavior, and conservation. Laboratory emphasizes identification of local taxa. Field trips may be required.

**Prerequisite(s)/Corequisite(s):** BIOL 322 Zoology. Prerequisite(s): BIOL 111G and BIOL 111L.

**FWCE 355. Wildlife Techniques and Analysis****4 Credits (3+2P)**

FWCE 355 will provide a broad overview of basic skills and techniques that are commonly used by biologists in performing management, research, and reporting functions in natural resource fields with an emphasis on wildlife techniques, data processing and analysis.

**Prerequisite(s):** FWCE 301, A ST 311.

**FWCE 357. Fisheries Management and Analysis****4 Credits (3+2P)**

Lectures and laboratory exercises provide a broad overview of basic skills and techniques used for assessing and managing fish populations.

**Prerequisite(s):** FWCE 301 and A ST 311.

**FWCE 391. Internship****1-3 Credits (1-3)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**Prerequisite(s):** Consent of instructor.

**FWCE 393. Professional Experience and Communication****3 Credits**

Professional work experience under the supervision of employer and/or a faculty member. Written report and presentation is required.

**Prerequisite(s)/Corequisite(s):** FWCE 255.

**FWCE 402. Seminar in Natural Resource Management****1 Credit**

Review and discussion of current topics in natural resource management.

**Prerequisite(s):** Senior standing or above.

**FWCE 409. Introduction to Population Ecology****3 Credits**

Quantitative analysis of vital statistics and mechanisms affecting dynamics of wild populations. Patterns of growth, age structure, survival, and natality. Population theories and life tables.

**Prerequisite(s):** MATH 142G and FWCE 255.

**FWCE 430. Avian Field Ecology****4 Credits (3+3P)**

Principles of avian ecology and management with an emphasis on taxonomy, physiology, behavior and field studies. Includes weekly field trips focusing on identification and behavior of Southwest birds. Pre/

**Prerequisite(s)/Corequisite(s):** WLSC 330.

**FWCE 431. Mammalogy****4 Credits (3+2P)**

Classification, identification, anatomy, physiology, life history, and ecology of mammals. Field trips required.

**Prerequisite(s):** FWCE 255 and FWCE 330.

**FWCE 432. Environmental Biology of Fishes****4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 532.

**Prerequisite(s):** CHEM 111G and senior standing.

**FWCE 433. Fisheries Management****3 Credits**

This course is designed to introduce students to the basic principles of fisheries management. Students will learn the techniques and tools used to collect, analyze, and interpret fisheries data needed to undertake fisheries management decisions. Taught with FWCE 533. Consent of Instructor required.

**Prerequisite(s):** FWCE 482 and A ST 311.

**FWCE 434. Aquatic Contaminants and Toxicology****4 Credits (3+3P)**

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Taught with FWCE 534. Crosslisted with: E S 434.

**Prerequisite(s):** CHEM 111G and senior standing.

**FWCE 436. Large Mammal Ecology, Conservation and Management****3 Credits**

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 530. Consent of Instructor required.

**FWCE 437. Wildlife Damage Management****3 Credits**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 537.

**Prerequisite(s):** BIOL 111G, FWCE 255, FWCE 301, FWCE 409.

**FWCE 439. Game Bird Ecology and Management****3 Credits**

In this class we will look at the overall history of game bird management and conservation, how management and conservation of game birds was and still is the foundation for wildlife conservation in North America, define the challenges both past and present to managing and conserving game bird populations, and explore the conceptual and quantitative models used to manage migratory and non-migratory game birds. Taught with FWCE 539. Consent of Instructor required. Restricted to: WLSC,FISH majors.

**Prerequisite(s):** FWCE 301, FWCE 409, A ST 311 or equivalent.

**FWCE 440. Wildlife Habitat Relationships****3 Credits**

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter-and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses. Taught with FWCE 540. Consent of Instructor required.

**FWCE 447. Wildlife Law and Policy****3 Credits**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 547.

**Prerequisite(s):** Junior or Senior level standing.

**FWCE 448. Problems****1-3 Credits (1-3)**

Individual investigations in fishery or wildlife science. Maximum 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** 18 credits in WLSC.

**FWCE 450. Special Topics****1-4 Credits (1-4)**

Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester. May be repeated up to 9 credits. Consent of Instructor required.

**FWCE 457. Ecological Biometry****3 Credits**

Use of ecological data to test scientific hypotheses, stochastic and statistical models for environmental data, data visualization, likelihood-based and information-based model selection. Emphasis on open-source software tools.

**Prerequisite(s):** MATH 142G or 191G, E ST 311, FWCE 301.

**FWCE 459. Aquatic Ecology****4 Credits**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 559.

**Prerequisite(s):** FWCE 301 or BIOL 301, CHEM 112, MATH 142G.

**FWCE 464. Management of Aquatic and Terrestrial Ecosystems****4 Credits (3+2P)**

Principles and methods for managing aquatic and terrestrial ecosystems and their fish and wildlife resources. Emphasis on quantitative techniques, data collection and analysis for management of systems at a landscape spatial scale.

**Prerequisite(s):** (BIOL 301 or FWCE 301) FWCE 330, A ST 311G.

**FWCE 467. Herpetology****4 Credits**

Systematics, taxonomy, ecology, behavior, and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 567.

**Prerequisite(s):** FWCE 330.

**FWCE 471. GIS for Natural Resource Scientists****4 Credits**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 571.

**FWCE 472. Wildlife Museum Internship****1-4 Credits (1-4)**

Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. May be repeated up to 9 credits. Consent of Instructor required.

**Prerequisite(s):** BIOL 111G and BIOL 111GL.

**FWCE 473. Natural History Museum Functions Methods****3 Credits**

Fundamentals of the function and methods of natural history museums in research, education, service, and biodiversity conservation. Emphasis on experiential learning. Includes lectures, paper discussions, laboratory activities, specimen preparation, required full-day Friday field trips, and an individual term project.

**Prerequisite(s):** FWCE 330 or BIOL 322 or BIOL 312 or RGSC 316.

**FWCE 482. Ichthyology****4 Credits (3+2P)**

Classification, morphology, identification, life history, and ecology of fishes.

**Prerequisite(s):** FWCE 330 or consent of instructor.

**FWCE 509. Population Ecology (s)****3 Credits (2+2P)**

Quantitative analysis of vital statistics and mechanisms promoting stability in wild populations. Theory and application of life tables and population models.

**FWCE 515. Graduate Seminar****1 Credit**

Current topics.

**FWCE 530. Large Mammal Ecology, Conservation and Management****3 Credits**

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 436.

**FWCE 532. Environmental Biology of Fishes****4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 432; however, students are responsible for all requirements in FWCE 432, plus additional assignments.

**FWCE 533. Fisheries Management****3 Credits**

This course is designed to introduce students to the basic principles of fisheries management. Students will learn the techniques and tools used to collect, analyze, and interpret fisheries data needed to undertake fisheries management decisions. Taught with FWCE 433. Consent of Instructor required.

**Prerequisite(s):** FWCE 482, A ST 311.

**FWCE 534. Aquatic Contaminants and Toxicology****4 Credits (3+3P)**

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Students are responsible for all requirements for FWCE 434 plus additional work.

**FWCE 535. Special Topics****1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**FWCE 536. Advanced Avian Ecology****3 Credits**

Focuses on current topics and literature in avian ecology including systematics, mating systems, behavior, physiology, movement patterns and conservation. Includes required overnight field trips.

**Prerequisite(s):** Graduate standing or consent of instructor.

**FWCE 537. Wildlife Damage Management****3 Credits**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 437. Students are responsible for all requirements for FWCE 437 plus additional work. Prerequisite(s): BIOL 111G, FWCE 255, FWCE 301 and FWCE 409

**FWCE 539. Game Bird Ecology and Management****3 Credits**

In this class we will look at the overall history of game bird management and conservation, how management and conservation of game birds was and still is the foundation for wildlife conservation in North America, define the challenges both past and present to managing and conserving game bird populations, and explore the conceptual and quantitative models used to manage migratory and non-migratory game birds. Taught with FWCE 439. Restricted to: WLSC, FISH majors.

**Prerequisite(s):** FWCE 301, FWCE 409, A ST 311 or equivalent.

**FWCE 540. Wildlife Habitat Relationships****3 Credits**

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses. Taught with FWCE 440.

**FWCE 547. Wildlife Law and Policy****3 Credits**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 447.

**FWCE 548. Graduate Problems****1-3 Credits (1-3)**

Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree. May be repeated up to 6 credits.

**FWCE 558. Nonthesis Project****1-6 Credits (1-6)**

Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students. May be repeated up to 6 credits.

**FWCE 559. Aquatic Ecology****4 Credits**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 459.

**Prerequisite(s):** FWCE 301 or BIOL 301, CHEM 112, MATH 142G.

**FWCE 567. Herpetology****4 Credits**

Systematics, taxonomy, ecology, behavior and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 467.

**FWCE 571. GIS for Natural Resource Scientists****4 Credits**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 471.

**FWCE 582. Ichthyology****4 Credits**

Classification, morphology, identification, life history, and ecology of fishes. Taught with FWCE 482.

**FWCE 598. Special Research Programs****1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program. May be repeated up to 6 credits.

**FWCE 599. Master's Thesis****1-9 Credits (1-9)**

Thesis. May be repeated up to 30 credits. Thesis/Dissertation Grading.

## G S-GRADUATE STUDIES (G S)

**G S 500. Masters Non-Thesis Final Exam Credit****1 Credit**

Course for non-thesis masters students who have completed all program requirements except the final comprehensive exam. A maximum of 12 credits may be earned. Graded S/U.

**Prerequisites:** advisor signature required.

**G S 600. Doctoral Research****1-15 Credits**

Course number is used for assigning credit for research performed prior to successful completion of the doctoral comprehensive examination.

**G S 700. Doctoral Dissertation****15 Credits**

Dissertation.

## GENE-GENETICS (GENE)

**GENE 110. Experimental Systems in Genetics****1 Credit**

Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.

**GENE 303V. Genetics and Society****3 Credits**

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: AGRO303V.

**GENE 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, ANSC 305, BIOL 305 and HORT 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**GENE 305 L. Genetic Techniques****1 Credit**

Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics. Pre/

**Corequisite(s):** GENE 315, or AGRO/ANSC/BIOL/HORT 305.

**GENE 315. Molecular Genetics****3 Credits**

Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics.

**Prerequisite(s)/Corequisite(s):** . Prerequisite(s): CHEM 112 and BIOL 211. Recommend CHEM 313.

**GENE 320. Hereditary and Population Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.

**Prerequisite(s):** CHEM 111G & BIOL 211G.

**GENE 391. Genetics Laboratory****1-6 Credits (1-6)**

Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**GENE 440. Genetics Seminar****1 Credit**

Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology. Consent of instructor required.

**Prerequisite(s):** Seniors only; GENE 315 & GENE 320.

**GENE 449. Special Problems****1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

**GENE 450. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

**GENE 452. Applied Bioinformatics****3 Credits**

Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.

**GENE 486. Genes and Genomes****3 Credits**

Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

**GENE 488. Gene Regulation****3 Credits**

Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes.

**Prerequisites:** AGRO/ANSC/BIOL/HORT 305 or GENE 315.

## GEOG-GEOGRAPHY (GEOG)

**GEOG 111G. Geography of the Natural Environment****4 Credits (3+3P)**

Introduction to the physical processes that shape the human environment: climate and weather, vegetation dynamics and distribution, soil development and classification, and geomorphic processes and landform development.

**GEOG 112G. World Regional Geography****3 Credits**

Overview of the physical geography, natural resources, cultural landscapes, and current problems of the world's major regions. Students will also examine current events at a variety of geographic scales.

**GEOG 120G. Culture and Environment****3 Credits**

Study of human-environmental relationships: how the earth works and how cultures impact or conserve nature. Introduction to relationships between people and natural resources, ecosystems, global climate change, pollution, and conservation.

**GEOG 257. Introduction to Weather Science****4 Credits (3+3P)**

Introduction to Earth's atmosphere and the dynamic world of weather as it happens. Working with current meteorological data delivered via the Internet and coordinated with learning investigations keyed to the current weather; and via study of select archives. Crosslisted with: SOIL 257 and AGRO 257

**Prerequisite(s):** None.

**GEOG 259. Introduction to Oceanography****4 Credits (3+3P)**

Introduces the origin and development of the ocean and marine ecological concepts. Examines physical processes such as waves, tides, and currents and their impact on shorelines, the ocean floor, and basins. Investigates physical processes as they relate to oceanographic concepts. Includes media via the Internet and laboratory examination of current oceanic data as an alternative to the actual oceanic experience. Students will gain a basic knowledge and appreciation of the ocean's impact on the world's ecology. Branch campuses only. Consent of Instructor required.

**GEOG 281. Map Use: Reading, Analysis and Interpretation****3 Credits (2+3P)**

Exploration of the cartographic medium. Development of critical map analysis and interpretation skills, and map literacy. Comprised of traditional lecture, labs, and map use projects.

**GEOG 291. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**GEOG 295. Introduction to Climate Science****4 Credits (3+3P)**

Examines fundamentals and related issues of Earth's climate system, climate variability, and climate change. Develops solid understandings of Earth's climate system framed in the dynamic, Earth system based approach to the science. Branch Campuses only. May be repeated up to 4 credits.

**GEOG 315V. World Agriculture and Food Problems****3 Credits**

Same as AG E 315V.

**GEOG 325V. New Mexico and the American West****3 Credits**

Examination of the cultural and historical patterns, economic activities and physical characteristics of New Mexico with comparisons made with other western states.

**GEOG 326. U.S. National Parks****3 Credits**

Exploration of origins, landscapes, ecosystems, management issues, and conflicts in U.S. National Parks. The regional geography of the United States as seen through the creation and protection of biologically and culturally significant lands.

**GEOG 328V. Geography of Latin America****3 Credits**

Explores Latin America from a geographical perspective, integrating environmental, cultural and socioeconomic factors in an in-depth study of the development of the region and contemporary issues and challenges facing the region.

**GEOG 331V. Europe****3 Credits**

Focus on the cultural continent of Europe, from Iceland to the Ural Mountains and from Archangel, Russia, to Malta. An overview of climate, physical geography, and human geography of Europe, including a brief historical geography of the continent. Current environmental, social, and political issues of Europe will be discussed. A series of regional studies is also offered.

**GEOG 351. Fundamentals of Biogeography****3 Credits**

Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment; field and laboratory techniques including remote sensing. Taught with GEOG 557.

**GEOG 353. Geomorphology****3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 553.

Crosslisted with: GEOL 353.

**Prerequisite(s):** C- or better in GEOL 111G OR GEOG 111G.

**GEOG 357. Climatology****3 Credits**

Elements and controls of climate. Energy and hydrologic cycles, general circulation, climate classification, distribution of climate types, microscale effects, applications. Same as AGRO 357, SOIL 357.

**Prerequisite(s):** C- or better in MATH 120.

**GEOG 361V. Economic Geography****3 Credits**

The geographic relationships of supply and demand resources, population, and transportation. Site analysis and decision-making in different economic systems and cultures and how these decisions affect the environment and the location of economic activities.

**GEOG 363V. Cultural Geography****3 Credits**

The world's diverse cultural landscapes. Emphasis on the connections between social, political, religious, and agricultural patterns and the impact of societies on the natural environment.

**GEOG 365V. Urban Geography****3 Credits**

The global historical development of urban areas, as well as the changing functions of today's cities. A comparison between the North American city system and cities in Europe, Asia, and South America, including the development of the city form, the internal spatial organization of commercial, residential, and industrial areas, and socio-economic and political factors.

**GEOG 373. Introduction to Remote Sensing****4 Credits (3+3P)**

Introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing products. Taught with GEOG 573.

**GEOG 381. Cartography and Geographic Information Systems****4 Credits (3+3P)**

Design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 571.

**GEOG 401. Internship/Co-op****1-3 Credits (1-3)**

Provides an opportunity whereby students work with a local, regional, or federal agency, or private sector firm on applied geographic work, under the supervision of an agency or firm professional and a geography faculty member. Consent of instructor required.

**GEOG 435. Environmental Planning****3 Credits**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 535.

**GEOG 441. System Design for Geographic Information Science and Technology (GIS&T)****3 Credits**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted system design methodologies intended to create a successful implementation of GIS inside organizations. Taught with GEOG 581.

**Prerequisite(s):** C- or better in GEOG 481.

**GEOG 452. Landscape Ecology****4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Taught with GEOG 552.

**Prerequisite(s):** C- or better in GEOG 351, BIOL 301, or other basic ecology course.

**GEOG 455. Southwest Environments****3 Credits**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 555.

**GEOG 467. Transportation Geography****3 Credits**

Nature and distribution of land, air and water transport facilities and their importance in regional development.

**Prerequisite(s):** C- or better in GEOG 120G.

**GEOG 472. Soil Morphology and Classification****4 Credits (2+2P)**

Same as SOIL 472. Crosslisted with: SOIL 472.

**GEOG 473. Advanced Remote Sensing****4 Credits (3+3P)**

Introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. Taught with GEOG 573.

**Prerequisite(s):** C- or better in GEOG 373.

**GEOG 481. Fundamentals of Geographic Information Science and Technology (GIS & T)****4 Credits (3+3P)**

Fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Taught with GEOG 578.

**Prerequisite(s):** C- or better in GEOG 281 or GEOG 381.

**GEOG 482. Geodatabase Design****3 Credits (2+3P)**

A practical introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally, implementation and documentation. Taught with GEOG 572.

**Prerequisite(s):** C- or better in GEOG 481.

**GEOG 483. Field Explorations in Geography****3 Credits**

A field-based class where students complete exercises in physical, human, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. Taught with GEOG 583.

**GEOG 488. GIS and Water Resources****3 Credits**

Explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student area of interest. Taught with GEOG 588.

**GEOG 491. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**GEOG 492. GIS&T Applications and Modeling****3 Credits**

Group oriented class in which students conduct an applied research project in GIS application or modeling area of choice and conduct focused library research. Taught with GEOG 521.

**Prerequisite(s):** C- or better in GEOG 481.

**GEOG 493. Special Problem Research****1-3 Credits**

For advanced and exceptional students. Research, and preparation of a paper in some phase of geography. A maximum of 6 credits may be earned. Consent of instructor required.

**GEOG 495. Directed Readings****1-3 Credits**

Individual study through selected readings. A maximum of 6 credits may be earned. Consent of instructor required.

**GEOG 501. Research Design and History of Geographic Thought****3 Credits**

Understanding and application of the research process, including conceptualization and definition of a research problem, study designs, data sources, data collection, and report writing in development of geographic thought.

**GEOG 521. GIS & T Applications and Modeling****3 Credits**

Group oriented class in which students conduct an applied research project in a GIS application or modeling area of choice and conduct focused library research. Taught with GEOG 492.

**GEOG 535. Environmental Planning****3 Credits**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 435.

**GEOG 552. Landscape Ecology****4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Taught with GEOG 452.

**GEOG 553. Geomorphology****3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 353.

**GEOG 555. Southwest Environments****3 Credits**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 455.

**GEOG 557. Fundamentals of Biogeography****3 Credits**

Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment; field and laboratory techniques including remote sensing. Taught with GEOG 351.

**GEOG 571. Cartography and Geographic Information Systems****4 Credits (3+3P)**

Graduate level design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 381.

**GEOG 572. Geodatabase Design****3 Credits (2+3P)**

Graduate level introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally implementation and documentation. Taught with GEOG 482.

**GEOG 573. Introduction to Remote Sensing****4 Credits (3+3P)**

Graduate level introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing product. Taught with GEOG 373.

**GEOG 578. Fundamentals of Geographic Information Science and Technology (GIS & T)****4 Credits (3+3P)**

Graduate level fundamentals of computer-based systems that organize, analyze, and present spatially referenced data. Taught with GEOG 481.

**GEOG 581. System Design for Geographic Information Science and Technology (GIS & T)****3 Credits**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted planning methodologies designed to create a successful implementation of GIS inside organizations. Taught with GEOG 441.

**GEOG 582. Advanced Remote Sensing****4 Credits (3+3P)**

Graduate level introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. May be repeated up to 4 credits.

**GEOG 583. Field Explorations in Geography****3 Credits**

A graduate level field-based class where students complete exercises in physical, cultural, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. May be repeated up to 3 credits.

**GEOG 585. Advanced Spatial Analysis****3 Credits (3+2P)**

Introduction to basic spatial and aspatial descriptive statistics, statistical analysis of point and area patterns, critical review of quantitative research in geography, and exploration of advanced spatial analysis routines including cluster analysis, hot/cold spot analysis, and spatially weighted regression.

**Prerequisite(s):** Knowledge of basic statistics recommended.

**GEOG 588. GIS and Water Resources****3 Credits**

This is a graduate level class that explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student's area of interest. Taught with GEOG 488.

**GEOG 595. Directed Readings****1-3 Credits**

Advanced individual study through selected readings. May be repeated for a maximum of 6 credits.

**GEOG 596. Residency****3-12 Credits**

A contractual learning experience in the public or private sector under the supervision of a field supervisor and two faculty members. Restricted to majors. PR/U grading only.

**GEOG 598. Selected Topics****1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected geographic themes. May be repeated for unlimited credit.

**GEOG 599. Master's Thesis****1-12 Credits (1-12)**

Supervised individual study of a student's thesis topic. May be repeated for an unlimited number of credits. Thesis/Dissertation Grading.

# GEOL-GEOLOGY (GEOL)

## GEOL 111G. Introductory Geology

### 4 Credits (3+3P)

Covers the fundamental principles of physical geology, including the origin of minerals and rocks, geologic time, rock deformation, and plate tectonics. May be repeated up to 4 credits.

## GEOL 212G. The Dynamic Earth

### 4 Credits (3+3P)

Introduction to earth systems. Geology and the solid earth, geologic time and earth history, water and the world oceans, atmosphere and weather, the solar system. Community Colleges only.

## GEOL 220. Special Topics

### 1-3 Credits

Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits.

## GEOL 305V. Fossils and the Evolution of Life

### 3 Credits

Examination of the fossil record within the context of geologic time. Special emphasis on critical evaluation of possible terrestrial and extra-terrestrial causes for the evolution of plants and animals and for periods of mass extinction.

## GEOL 310. Mineralogy

### 3 Credits (2+3P)

Crystallography and the physical and chemical aspects of minerals.

**Prerequisite(s):** GEOL 111G and CHEM 111G.

## GEOL 312. Optical Mineralogy

### 3 Credits (2+3P)

Principles of optical mineralogy as applied to the identification and characterization of rock-forming minerals.

**Prerequisite or Corequisite:** GEOL 310.

## GEOL 320. Special Topics

### 1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

## GEOL 335V. Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present

### 3 Credits

This class will provide an introduction to geologic hazards and natural disasters, their effects on society and the attempts at preparation and mitigation for these events. Hazards to be covered include earthquakes, volcanic eruptions, floods, landslides, hurricanes, tsunamis and others.

## GEOL 353. Geomorphology

### 3 Credits (2+3P)

Same as GEOG 353. May be repeated up to 3 credits.

## GEOL 360. General Geochemistry

### 3 Credits

The chemistry of the earth and its parts, with emphasis on geochemical systems and cycles, distribution of the elements, and mineral equilibria. Crosslisted with: CHEM 360

**Prerequisite(s):** CHEM 111G or CHEM 110G.

## GEOL 399. Igneous and Metamorphic Petrology

### 3 Credits (2+3P)

Mineralogical composition, classification, and genesis of igneous and metamorphic rocks.

**Prerequisite(s):** GEOL 312 for geology majors, GEOL 310 for majors other than geology.

## GEOL 401. Geology Colloquium

### 1 Credit

Presentations by visiting speakers and students. May be repeated up to 6 credits.

## GEOL 420. Stratigraphy and Sedimentology

### 3 Credits (2+3P)

Identification and interpretation of sedimentary rocks with emphasis on classification, deposition, and stratal geometry.

**Prerequisite:** GEOL 310.

## GEOL 424. Soil Chemistry

### 3 Credits

Same as SOIL 424, CHEM 424.

## GEOL 434. Tectonics of Sedimentary Basins

### 3 Credits

Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Crosslisted with: GEOL 534.

**Prerequisite(s):** GEOL 420.

## GEOL 441. Tutorial Geology

### 2 Credits (1+3P)

Participation in teaching lower-division laboratories and conducting tutorial sessions. May be repeated for a total of 4 credits.

**Prerequisite:** junior or above standing and nomination by faculty.

## GEOL 442. Zuhl Collection Internship

### 1-3 Credits (3-9P)

Applied experience with the NMSU Zuhl Collection, under supervision of the Zuhl Collection Director. Possible activities include developing displays, giving tours, developing outreach materials, etc. May be repeated up to 6 credits. Consent of Instructor required.

## GEOL 444. GIS for Geology

### 3 Credits

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOG 544.

**Prerequisite(s):** GEOL 470.

## GEOL 449. The Geological Profession

### 1 Credit

Outcomes assessment exit exams. For graduating seniors only. May be repeated up to 1 credits.

**Prerequisite(s):** Graduating seniors only.

## GEOL 452. Geohydrology

### 4 Credits (3+2P)

Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits.

Crosslisted with: E S 452 and C E 452.

**Prerequisite(s):** Junior or senior, MATH 121G.

**GEOL 455. Undergraduate Research****1-3 Credits**

Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**GEOL 465. Isotope Geochemistry****3 Credits**

Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences.

**Prerequisite(s):** CHEM 112G, GEOL 360, GEOL 399.

**GEOL 470. Structural Geology****3 Credits (2+3P)**

Deformation of rocks of the earth. Prerequisite: GEOL 310

**GEOL 471. Volcanology****3 Credits**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruption dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 571.

**Prerequisite(s):** GEOL 399.

**GEOL 475. Geology of Mineral Resources****3 Credits (2+3P)**

Introduction to ore deposits and industrial rocks and minerals; genesis, mining methods, estimation of reserves, exploration, and economic aspects of selected commodities.

**Prerequisite:** GEOL 399.

**GEOL 477. Special Problems****1-3 Credits**

Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits.

**Prerequisite:** consent of instructor.

**GEOL 478. Petroleum Systems and Stratigraphy****3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments, and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips. May be repeated up to 3 credits.

**Prerequisite(s):** GEOL 420.

**GEOL 480. Seminar****1-3 Credits**

Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**GEOL 482. Zuhl Collection Internship****1-3 Credits (1-3)**

Applied experience working with the Zuhl Collection of rocks, minerals, fossils, and petrified wood, supervised by the Director of the Zuhl Collection. Activities include tours, display development, research on aspects of the collection, and other work in the museum. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: GEOL majors.

**GEOL 490. Field Geology****3 Credits**

Mapping, instrumentation, and interpretation of geology in the field.

**Prerequisites:** either GEOL 420 and GEOL 470.

**GEOL 491. Tectonic Evolution of North America****3 Credits**

Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development.

**Prerequisites:** GEOL 111G, GEOL 399, GEOL 420 and GEOL 470.

**GEOL 495. Geology Field Camp****4 Credits**

Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490

**GEOL 499. Senior Thesis****1-3 Credits**

Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Restricted to majors.

**Prerequisite:** consent of instructor.

**GEOL 501. Geology Colloquium****1 Credit**

Presentations by visiting speakers and graduate students.

**GEOL 520. Selected Topics****1-3 Credits**

Selected topics in geology. May be repeated for unlimited credit.

**Prerequisites:** graduate standing and consent of instructor.

**GEOL 534. Tectonics of Sedimentary Basins****3 Credits**

Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Restricted to: GEOL majors.

**Prerequisites:** GEOL 420 or equivalent or consent of instructor.

**GEOL 537. Topics in Volcanology****3 Credits**

A seminar-style class exploring volcanic processes. Course topics vary by semester and include: magmatism and volcanism at different tectonic settings (subduction zones, intraplate) and plumbing systems and eruptions of volcanoes (calderas, monogenetic volcanoes).

**GEOL 544. GIS for Geology****3 Credits**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOL 444.

**Prerequisite(s):** GEOL 470 or equivalent.

**GEOL 558. Neotectonics****3 Credits**

Recognition, measurement, and dating of deformation related to earthquakes in the Quaternary geologic record.

**GEOL 562. Analytical Geochemistry****3 Credits**

Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.

**GEOL 565. Isotope Geochemistry****3 Credits**

Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.

**GEOL 571. Volcanology****3 Credits**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruptions dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 471.

**GEOL 578. Petroleum Systems and Stratigraphy****3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips.

**GEOL 582. Plate Tectonics****3 Credits**

Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.

**GEOL 585. Geochronology****3 Credits**

The principles, analytical methods, and interpretation of the most common geochronologic methods.

**GEOL 598. Special Research Programs****1-3 Credits**

Investigations into contemporary geological problems. May be repeated for unlimited credit.

**Prerequisites:** graduate standing and consent of instructor.

**GEOL 599. Master's Thesis****15 Credits**

Thesis research.

## GER-GERMAN (GER)

**GER 111. Elementary German I****4 Credits**

German for beginners. Stress on speaking skills.

**GER 112. Elementary German II****4 Credits**

German for beginners and students with one year of high school German. Stress on speaking skills.

**Prerequisite:** C or better in GER 111.

**GER 211. Intermediate German I****3 Credits**

Speaking, reading and writing.

**Prerequisite:** C or better in GER 112.

**GER 212. Intermediate German II****3 Credits**

Speaking, reading and writing.

**Prerequisite:** C or better in GER 211.

**GER 305. Topics in German Culture****3 Credits**

Overview of Germany - states, cities, landscapes and people. May be repeated up to 6 credits.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 313. Intermediate Composition and Grammar****3 Credits**

Exercises in written German with emphasis on advanced grammatical features. Preparation for Zertifikat Deutsch.

**Prerequisite:** GER 212, or high school German 3, or consent of instructor.

**GER 325. German Conversation I****3 Credits**

Spoken German with emphasis on everyday situations.

**Prerequisite:** GER 212, or high school German 3, or consent of instructor.

**GER 330. Business German****3 Credits**

An introduction to standard language within the corporate world in German-speaking countries. During the semester, students will practice reading, writing, listening, speaking and expanding their vocabulary in the fields related to business, technology (ex. Engineering) and health (ex. Nursing, Psychology, etc.).

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 333V. German Culture through Cinema****3 Credits**

Events, values and issues in German culture as reflected in motion pictures made in Germany between 1913 and 1990. Familiarization with cinema as art form. Taught in English. Does not satisfy Arts and Sciences second language requirement.

**GER 340. German Linguistics****3 Credits**

Analysis of the German language.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 341. German Folklore and Culture****3 Credits**

Customs, traditions, mythology, folk literature and art; everyday culture of German-speaking Europe.

**Prerequisite:** GER 212 or equivalent or consent of instructor.

**GER 343. Readings in Current Events****3 Credits**

Practice in improving reading skills with a wide variety of texts.

Discussion in German also enhances oral skills.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 350. Introduction to German Literature****3 Credits**

Basic literary genres and major figures in German literature from the 18th century to the present.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 399. Intermediate Independent Study in German****1-3 Credits (1-3)**

Tutorial in reading, writing and oral expression. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** GER 212 or consent of instructor.

**GER 410. Practicum in Conversational German****1-3 Credits**

Intensive oral practice as language monitor. May be repeated for a maximum of 6 credits.

**Prerequisite:** two upper division German courses or consent of instructor.

**GER 413. Advanced Composition and Grammar****3 Credits**

Exercises in written German with emphasis on stylistic features.

**Prerequisite:** GER 313 or consent of instructor.

**GER 425. Advanced German Conversation****3 Credits**

Advanced conversation through intensive oral practice.

**Prerequisite(s):** GER 325 or consent of instructor.

**GER 449. Special Problems****1-3 Credits**

Directed reading for graduate students in their specific fields to satisfy language requirements for master's or doctoral programs. May be repeated for a maximum of 6 credits.

**GER 451. Special Topics in German****1-3 Credits**

Selected topics in German language, literature or area studies announced in Schedule of Classes. May be repeated for credit when topic changes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**GER 453. Independent Studies in German****1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students. May be repeated up to 12 credits.

**Prerequisite(s):** Consent of instructor.

**GER 471. Studies in German Literature****3 Credits**

Selected readings from authors representative of each literary period. May be repeated up to 6 credits.

**Prerequisite(s):** GER 212 or consent of instructor.

## GERO-GERONTOLOGY (GERO)

**GERO 415. Introduction to Gerontology****3 Credits**

Social, psychological, and physiological aspects of aging, with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. Taught with MPH 515.

**GERO 450. Health Promotion for the Older Adult****3 Credits**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Same as MPH 557.

**GERO 451. Aging and Public Policy****3 Credits**

Exploration of public policies relating to elders, historical development, current status and trends in public policy for this age group. Impact of political behavior of elders on policy making and implementing processes.

**GERO 493. Adulthood and Aging****3 Credits**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. Same as MPH 593.

**GERO 498. Independent Study****1-3 Credits**

Individual studies with prior approval of health science department head. May be repeated for maximum of 6 credits.

**Prerequisite:** senior standing and consent of instructor.

## GOVT-GOVERNMENT (GOVT)

**GOVT 100G. American National Government****3 Credits**

Class critically explores political institutions and processes including: the U.S. constitutional system; legislative, executive and judicial processes; political parties, elections, media, policy making, civic participation, popular and group influence

**GOVT 101. Introductory Government Seminar****1 Credit**

Introduction to the government major. Designed to assist students in planning college experience and preparing for professional or advanced educational opportunities upon graduation. Graded: S/U. Restricted to: Main campus only.

**GOVT 110G. Introduction to Political Science****3 Credits**

This class covers fundamental concepts such as justice, sovereignty and power; political theories and ideologies; and government systems that range from democratic to authoritarian.

**GOVT 150G. American Political Issues****3 Credits**

Major contemporary problems of American society and their political implications.

**GOVT 160G. International Political Issues****3 Credits**

Current developments and issues in world politics.

**GOVT 201. Special Topics****3 Credits**

Specific topics to be announced in Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

**GOVT 300. Political Research Skills****3 Credits**

Introduction to methods of political analysis and fundamentals of research design, including basic methods for the collection and analysis of political data.

**GOVT 308. Prepping for Law School Admissions Test****1 Credit**

This workshop helps students prepare to take the Law School Admissions Test and apply for law school. Graded: S/U.

**GOVT 313. Model United Nations****3 Credits**

Issues related to the United Nations and international law/organizations through simulations, discussions and research projects.

**Prerequisites:** GPA of 2.5 or better and consent of instructor.

**GOVT 314. Advanced Model UN****3 Credits**

Advanced topics, research and preparation for Model United Nations activities. Consent of instructor required. Restricted to: Main campus only.

**Prerequisite(s):** GOVT 313, minimum GPA 2.5.

**GOVT 315. Politics and Film****3 Credits**

Exploration of political themes, images, and representation in film and other media. May be repeated for a maximum of 6 credits under different subtitles.

**GOVT 320. Domestic Policy****3 Credits**

The course examines how U.S. public policy is made, including the players, politics, issues and power critical to the policy process. An interactive class that bridges theory and political action. Restricted to: Main campus only.

**GOVT 321. Topics in Public Policy****3 Credits**

Course examines issues in public policy. May be repeated under different subtitles.

**GOVT 324. Environmental Policy****3 Credits**

This introductory course explores environmental policy issues. Students study perspectives of policy-makers, political activists and policy analysts, and apply policy models to solve pressing environmental problems. Focus may be on U.S. or global concerns.

**GOVT 325. Education Policy and Politics****3 Credits**

Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy as the main approach.

**GOVT 330. Introduction to Public Administration****3 Credits**

What is public administration? Course examines public service, focusing on federal and state government. Issues include management and leadership, personnel, bureaucratic politics, organizational theory, personnel, budgeting and administrative law. Restricted to: Main campus only.

**GOVT 331. Special Topics in Public Administration****3 Credits**

Special topics in public administration. May be repeated for a maximum of 6 credits under different subtitles.

**GOVT 335. Management of Nonprofit Organizations****3 Credits**

This course provides an overview of a range of nonprofit management concerns and practices. Students will be challenged to assess their own theories of nonprofit accountability and excellence, while confronting critical issues facing the sector. Activities are designed to expand the management skills of students by offering analytical tools and knowledge, and providing opportunities to test the application of these skills.

**GOVT 343. Congress and the Legislative Process****3 Credits**

This class reviews the history, structure, membership, operation, power and culture of the American Congress. Restricted to: Main campus only.

**GOVT 344. The American Presidency****3 Credits**

A comprehensive overview of the U.S. presidency, including powers, electoral politics, decision-making styles, domestic and foreign policy, and relations with Congress, courts, media and interest groups.

**GOVT 345. The Supreme Court****3 Credits**

This class studies the history and operation of the Supreme Court, as well as landmark cases that have shaped American government and the Court.

**GOVT 348. Political Parties and Interest Groups****3 Credits**

Organization, principles, and functions of political parties and interest groups in the U.S.

**GOVT 350. Special Topics in American Government****3 Credits**

Special topics in American government. May be repeated for a maximum of 6 credits under different subtitles.

**GOVT 353. Women, Politics and Administration****3 Credits**

An examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Also explores the influence of feminism in changing women's roles socially, legally, and politically. Crosslisted with: W S 453

**GOVT 354. American Indian Politics****3 Credits**

Introduction to American Indian tribal governments, politics, policy, and administration; historical and contemporary leadership of Indian Nations; and the history and current status of American Indian-U.S. relations. Students learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization. Restricted to: Main campus only.

**GOVT 360. International Relations****3 Credits**

Introduction to world politics; fundamental international issues and problems.

**GOVT 361. Special Topics in International Relations****3 Credits**

Course examines contemporary issues in international relations. May be repeated under different subtitles.

**GOVT 362. International Political Economy****3 Credits**

Political factors in international economic relations; theories of political economy.

**GOVT 366. American Foreign Policy****3 Credits**

Formulation, content and rationale of current foreign policies of the U.S.

**GOVT 367. Terrorism****3 Credits**

An introductory course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism.

**GOVT 368. Fundamentals of Intelligence Studies****3 Credits**

Introductory survey of the major theoretical approaches and substantive issues in intelligence studies.

**GOVT 370. Comparative Politics****3 Credits**

Introduction to functional approaches to comparing similarities and differences among political systems.

**GOVT 371. Latin American Politics****3 Credits**

Basic structure of politics in major Latin American countries; role of groups, including church, labor, and parties.

**GOVT 372. Special Topics in Comparative Politics****3 Credits**

Course examines contemporary issues in comparative politics. May be repeated under different subtitles. Restricted to: Main campus only.

**GOVT 373. Resistance Movements in World Politics****3 Credits**

Research on violent and non-violent resistance movements around the world. Focus on their origins, demands, ideologies, strategies and impacts in the post-Cold War context of economic globalization, US military power and new geopolitical dynamics.

**GOVT 375. Self Determination and Minority Rights****3 Credits**

Comparative study of ethnic relations, minority rights, identity, citizenship and political representation.

**GOVT 378. U.S.-Mexico Border Politics****3 Credits**

Comparative perspectives applied to the problems of the U.S.-Mexican border.

**GOVT 379. Mexican Politics****3 Credits**

Introduction to the politics and government of contemporary Mexico.

**GOVT 380V. Contemporary World Political Ideologies****3 Credits**

Introduction to the prevailing political ideologies in the modern world and the ways in which modern nations operating under one or more of these ideologies attempt to answer fundamental questions about the allocation and distribution of rights, liberties, and other things of value. In addition, the course work and discussions attempt to address recent political, social, and economic events in various areas of the world.

**GOVT 382. Classical Political Thought****3 Credits**

Analysis of main currents in political thought from ancient Greece and Rome to the high Middle Ages.

**GOVT 383. Modern Political Thought****3 Credits**

Historical and theoretical examination of political ideas and ideologies from Machiavelli to Nietzsche. Topics include liberalism, conservatism, romanticism, communism, and Nihilism.

**GOVT 384. Contemporary Political Thought****3 Credits**

Examination of major currents in political theory from early twentieth century to the present. Includes positivism, fascism, neo-liberalism, and varieties of postmodernism.

**GOVT 385. American Political Thought****3 Credits**

Introduction to major American thinkers and historical currents from colonial time to the present.

**GOVT 386. Political Economy****3 Credits**

Analysis of political ideas concerning the role of the state in management of national economies, in both European and American contexts.

**GOVT 387. Religion and Politics****3 Credits**

Survey of major points of interaction between politics and religion in the U.S., using theoretical, historical, and institutional analysis.

**GOVT 390. Special Topics in Public Law****3 Credits**

Course examines various issues in public law. May be repeated under different subtitles.

**GOVT 391. Constitutional Law****3 Credits**

The class explores the reasoning and political context of the Supreme Court cases that define the distribution and limits of governmental powers and duties under the U.S. Constitution, including separation of powers and federalism. Restricted to: Main campus only.

**GOVT 392. Civil Liberties****3 Credits**

The course examines the reasoning and political context of major Supreme Court cases defining constitutional rights of free speech, religious liberty, free press and criminal procedural rights.

**GOVT 394. Judicial Process****3 Credits**

Class examines the structure, function and purpose of the American judicial system. Restricted to: Main campus only.

**GOVT 395. Law and Society****3 Credits**

Class critically explores the development, role and impact of law on our society, covering different theories of law, conceptions of justice and the values they reflect. These models are then applied to current legal issues. Not a class in legal reasoning, but one where students evaluate their beliefs about the legal system. Restricted to: Main campus only.

**GOVT 396. International Law****3 Credits**

Nature, growth, and scope of law of nations, rights and obligations of states in peace and war, current issues.

**GOVT 399. New Mexico Law****3 Credits**

New Mexico legal system, court structure and procedures; legal terms and concepts; constitutional, criminal, mass media, historical and social issues relating to New Mexico. Same as C J 399, HIST 399, JOUR 399, and SOC 399.

**GOVT 405. Directed Readings****1-3 Credits**

Individualized readings. Course subtitled. May be repeated for a maximum of 6 credits. Graded S/U. Consent of instructor required.

**GOVT 406. Independent Study****1-3 Credits**

Individualized research. Course subtitled. May be repeated for a maximum of 6 credits. Consent of instructor required.

**GOVT 407. Workshop****1-6 Credits**

Focus on skills related to careers in government and political science. Specific topics announced in the Schedule of Classes; may be repeated for a total of 6 credits. Only 3 credits apply toward government major or minor requirements. Graded S/U.

**GOVT 410. Internship****1-12 Credits**

Hands-on experience working with public agencies, political campaigns, elected officials & non-profits. May be repeated for a maximum of 12 credits; only 3 credits apply toward government major or minor requirements. Consent of instructor required. Graded: S/U.  
**Prerequisite(s):** Completion of 12 government credits, 2.5 GPA, junior and above standing.

**GOVT 411. Service Learning Experience****3 Credits**

Experiential learning through a community service project. May be subtitled to reflect service activity. May be repeated for a total of 6 credits; only 3 credits apply toward government major or minor requirements.

**Prerequisites:** completion of 12 government credits, junior or above standing, and consent of instructor.

**GOVT 412. Practicum in Student Government****3 Credits**

Research of issues in student government. Consent of instructor required. Graded: S/U.

**Prerequisite(s):** Student government participation, completion of 12 GOVT credits, junior or senior standing.

**GOVT 415. Senior Seminar****2 Credits**

Review and integration of political skills acquired in the Government Department. Students will prepare a professional portfolio for entry into the workforce, advanced study, and civic participation. S/U Grading (S/U, Audit).

**GOVT 465. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as ANTH 459 and HIST 459.

**GOVT 468. Rebels, Guerrillas, and Terrorists in Modern Latin America****3 Credits**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Columbia's FARC, and Mexico's Zapatistas. Same as HIST 331.

**GOVT 469. Globalization****3 Credits**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOC 489.

**GOVT 474. European Politics****3 Credits**

Politics in European countries, European integration, post-communist states, regionalism and border politics.

**GOVT 493. Mass Communications Law****3 Credits**

Same as JOUR 493 and COMM 493.

**GOVT 502. Research Methods in Government****3 Credits**

Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications. MPA students must complete this class with a B- or better. MA students must complete either GOVT 502 or GOVT 503 with a B- or better.

**GOVT 503. Qualitative Research Methods****3 Credits**

An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology (the study of knowledge) and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects. MA students must complete either GOVT 503 or GOVT 502 with a B- or better.

**GOVT 505. Directed Readings****1-3 Credits**

Selected topics in government. May be repeated for a total of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**GOVT 510. Internship****1-6 Credits**

Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U.

**Prerequisite:** approval of graduate advisor.

**GOVT 517. Selected Topics in Government****3 Credits**

Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.

**GOVT 519. Proseminar in Public Administration****3 Credits**

Review of classic and contemporary theory and practice in public administration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. To be completed with a B- or better.

**Prerequisite(s):** 30 credits of M.P.A.

**GOVT 522. Public Sector Economics I****3 Credits**

Same as AEEC 522.

**GOVT 523. Public Sector Economics II****3 Credits**

Same as AEEC 523.

**GOVT 527. Issues in Public Management****3 Credits**

Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.

**GOVT 530. Seminar in Public Policy****3 Credits**

Survey of the political, administrative, and technical aspects of policy making in government. MA students taking GOVT 530 as part of their core requirements must complete the class with a B- or better.

**GOVT 535. Education Policy and Politics****3 Credits**

Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy the main approach.

**GOVT 536. Public Policy and Indigenous Communities****3 Credits**

Indigenous communities are found throughout North, Central and South America. This course addresses the history, development and governance of these communities. Different sections of the course may choose to focus on different indigenous communities. All courses will consider the principles of governance internal to indigenous communities as well as the governing relationships between indigenous communities and modern states.

**GOVT 537. Issues in Public Policy****3 Credits**

Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.

**GOVT 540. Seminar in Public Administration****3 Credits**

Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector. MA students taking Govt 540 as part of their core requirements must complete the class with a B- or better.

**GOVT 541. Public Budgeting****3 Credits**

Budgetary processes; budget classification, analysis, and evaluation. MPA students must complete this class with a B- or better.

**GOVT 542. Public Sector Human Resources Management****3 Credits**

Exploration of public personnel systems and practices, including job analysis, compensation, performance evaluation, recruitment, and labor-management relations. MPA students must complete this class with a B- or better.

**GOVT 543. Skills Workshop****1-6 Credits**

Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes; may be repeated for a total of 6 credits.

**GOVT 544. Public Policy Analysis****3 Credits**

Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. MPA students must complete this class with a B- or better.

**Prerequisite(s):** GOVT 502 or consent of instructor.

**GOVT 547. Government Organizations****3 Credits**

Historical overview and present applications of organization theory in public management. MPA students must complete this class with a B- or better.

**GOVT 548. Public Sector Leadership****3 Credits**

Theories and styles of leadership.

**GOVT 549. Ethics in Government****3 Credits**

Examination of standards, perspectives, and issues for ethical decision-making in public agencies. MPA students must complete this class with a B- or better.

**GOVT 550. Seminar in American Politics****3 Credits**

Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation. MA students taking Govt 550 as part of their core requirements must complete the class with a B- or better.

**GOVT 560. Seminar in International Relations Theory****3 Credits**

A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics. MA students taking Govt 560 as part of their core requirements must complete the class with a B- or better.

**GOVT 561. Nations and Soft Power****3 Credits**

Course employs historical, theoretical and practical "best/worst practices" lenses to deal with key questions, such as how do the US and other states present themselves to the world? What are "soft power" and "national reputation management"? How does one build or damage a country's image and "brand"? What are "public diplomacy" and "cultural diplomacy", and how do they factor into the foreign relations of the US and other states?

**GOVT 563. Issues in International Relations****3 Credits**

Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.

**GOVT 564. Advanced National Security Policy****3 Credits**

Major topical, theoretical, and regional issues in national security policy.

**GOVT 569. Advanced Issues in Globalization****3 Credits**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOC 589.

**GOVT 570. Seminar in Comparative Politics****3 Credits**

Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries. MA students taking Govt 570 as part of their core requirements must complete the class with a B- or better.

**GOVT 574. Contemporary Comparative Studies****3 Credits**

Major topical, theoretical, and regional issues in international politics. May be repeated once.

**GOVT 578. Seminar in the U.S.-Mexican Border****3 Credits**

An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.

**GOVT 579. Seminar in Mexican Politics****3 Credits**

Advanced research on politics and government of Mexico.

**GOVT 580. Seminar in Political Theory****3 Credits**

Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter. MA students taking GOVT 580 as part of their core requirements must complete the class with a B- or better.

**GOVT 587. Seminar in Religion and Politics****3 Credits**

Historical, theoretical and comparative analyses of the interaction between politics and religion.

**GOVT 590. Seminar Public Law and Legal Systems****3 Credits**

Focus on U.S. Constitutional Law and other national legal systems. MA students taking Govt 590 as part of their core requirements must complete the class with a B- or better.

**GOVT 591. Law for Administrators****3 Credits**

Case-law definitions of the legal roles and powers of public administrators.

**GOVT 593. Issues in Public Law****3 Credits**

Selected issues in public law. May be repeated under a different subtitle for a total of 6 credits.

**GOVT 596. International Law****3 Credits**

Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.

**GOVT 598. Special Research Programs****1-3 Credits**

Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.

**GOVT 599. Master's Thesis****1-15 Credits**

Thesis.

## GPHY-GEOPHYSICS (GPHY)

**GPHY 340V. Planet Earth****3 Credits**

Formation and evolution of the Earth. Plate tectonics, volcanoes and earthquakes. Role of geological processes in the origin and evolution of life. Uniqueness of the Earth in the solar system.

**GPHY 450. Selected Topics****1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected areas of geophysics. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**GPHY 510. Geophysical Field Methods****1-3 Credits (3-9P)**

Field collection, reduction, and interpretation of geophysical data; equipment operation.

**GPHY 520. Selected Topics****1-3 Credits**

Formal treatment of graduate topics not covered in regular courses. May be repeated for unlimited credit.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.

**GPHY 530. Seismology****3 Credits**

Seismic wave propagation in a layered earth, ray theory, exploration techniques, earth structure, and seismicity. May be repeated up to 3 credits.

**Prerequisite(s):** PHYS 511 or consent of instructor.

**GPHY 540. Physics of the Earth and Planetary Interiors****3 Credits**

Formation and evolution of the Earth and planets. Internal physical and chemical structure. Pressure and temperature effects on rocks. Equations of state. Physical mechanisms of plate tectonics. Physics of the Earth's core, planetary magnetism, geodynamo.

**Prerequisites:** consent of instructor.

**GPHY 560. Applied Inverse Theory****3 Credits**

Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, over determined and under determined problems, linear and nonlinear problems. Computing experience desirable. May be repeated up to 3 credits. Consent of Instructor required.

**GPHY 598. Special Research Problems****1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for unlimited credit.

**GPHY 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**GPHY 620. Advanced Topics in Geophysics****3 Credits**

Advanced formal treatment of a topic or topics not covered in regular courses. May be repeated for unlimited credit.

**Prerequisite:** consent of instructor.

**GPHY 630. Theoretical Seismology I****3 Credits**

Advanced treatment of wave propagation, ray theory, inversion methods, extension to heterogeneous media, and free oscillations.

**Prerequisite(s):** GPHY 530.

**GPHY 700. Doctoral Dissertation****1-15 Credits (1-15)**

Dissertation.

## GRAD CROSS UNIV EXCH (GREX)

**GREX 600. Graduate Cross University Exchange****1-9 Credits**

## HIST-HISTORY (HIST)

**HIST 101G. Roots of Modern Europe****3 Credits**

Economic, social, political, and cultural development from earliest times to about 1700.

**HIST 102G. Modern Europe****3 Credits**

Economic, social, political, and cultural development from 1700 to the present.

**HIST 110G. Making History****3 Credits**

General introduction to history: how historians carry out research and develop interpretations about the past.

**HIST 111G. Global History to 1500****3 Credits**

Global economic, social, political and cultural developments to 1500. Thematic approach.

**HIST 112G. Global History Since 1500****3 Credits**

Global economic, social, political and cultural developments since 1500. Thematic approach.

**HIST 201G. Introduction to Early American History****3 Credits**

History of the United States to 1877, with varying emphasis on social, political, economic, diplomatic, and cultural development.

**HIST 202G. Introduction to Recent American History****3 Credits**

History of the United States since 1877, with varying emphasis on social, political, economic, diplomatic, and cultural development.

**HIST 211G. East Asia to 1600****3 Credits**

History of China, Korea, Vietnam, and Japan from earliest times through the sixteenth century. Emphasis on cultural and political developments and their social and economic contexts, and the interaction between East Asian societies.

**HIST 212G. East Asia since 1600****3 Credits**

History of China, Korea, Vietnam, and Japan from the sixteenth through the twentieth centuries. Emphasis on internal development of each country, as well as the social and political impact of Western Imperialism, and the emergence of each country's unique version of modern society.

**HIST 221G. Islamic Civilizations to 1800****3 Credits**

History of Islamic civilizations to 1800.

**HIST 222G. Islamic Civilizations since 1800****3 Credits**

History of Islamic civilizations since 1800.

**HIST 261. New Mexico History****3 Credits**

Economic, political, and social development of New Mexico from exploration to modern times. Community Colleges only.

**HIST 269. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

**HIST 300. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

**HIST 302V. Science in Modern Society****3 Credits**

The social impact of scientific activity and thought from Newton to the present. The growth of modern scientific institutions; the political and social context of modern science. ENGL 111G recommended.

**HIST 304. The Global Cold War****3 Credits**

Survey of the global history of the Cold War. The emergence of the USSR and US as global superpowers, their involvement in the end of the European great-power empire, the rise of petropolitics and the nuclear era, modern terrorism, and the creation of the First, Second and Third Worlds all have their roots in the Cold War. Although the Iron Curtain ran through Europe, with the Berlin Wall considered its main front, the Cold War's impact was not limited to Europe. Proxy wars were fought all over the world; the globe became a set or arenas of contestation. Students will carefully read historical documents as well as textbooks and literary works; in addition to close analysis of different kinds of sources, we will explore different kinds of historical writing.

**HIST 311V. Colonial Latin America****3 Credits**

Social, political, and economic development from Columbus to the Wars of Independence. Research paper required.

**HIST 312V. Modern Latin America****3 Credits**

Post-revolutionary developments in the nineteenth and twentieth centuries; the role of Latin America in world affairs and the Inter-American system. Research paper required.

**HIST 313. Making the American West****3 Credits**

Development of the American West from 1803 to 1900 with emphasis on conquest, federal and corporate roles in western development, environmental change, and the Mythic West. Includes meetings outside regular class time to view feature-length films.

**HIST 315. From the Wild West to the Atomic West****3 Credits**

Explores the transformation of the West with particular attention to the roles of race, class, gender and culture. Includes meetings outside regular class time to view feature-length films.

**HIST 316. History of Women in the American West****3 Credits**

Experiences and interactions among Native American, Spanish/Mexican, immigrant, and Anglo-American women in the American West from 1500 to the present. Same as WS 316.

**HIST 321. History of Korea****3 Credits**

Social, political, and cultural history of Korea from earliest times through twentieth century. Emphasis on the interaction between Korean traditions and influences from China and the West.

**HIST 323. Cultural History of Later Imperial China****3 Credits**

Covers art and literature of China from the Tang Dynasty (618-907) through the eighteenth century. Developments in cultural theory and practice are traced in the context of the social and economic changes fostering an understanding of Chinese cultural history and its legacy in East Asia today.

**HIST 323 L. Splendor of Imperial China****1 Credit**

This course consists of a FLIP trip to China, Spring 2014 which will explore the significant sites of imperial Chinese culture by spending 14 days traveling in China. Crosslisted with: ART 311 L and HIST 323.

**HIST 329. History of Egypt****3 Credits**

History of Egypt from ancient times to the present.

**HIST 330V. Introduction to Religious Studies****3 Credits**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. Same as SOC 330V and ANTH 330V.

**HIST 331. Rebels, Guerrillas, and Terrorists in Modern Latin America****3 Credits**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Colombia's FARC, and Mexico's Zapatistas. Same as GOVT 468.

**HIST 334. Art and Life in Renaissance Italy****3 Credits**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ART 444.

**HIST 338. World War I****3 Credits**

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war.

**HIST 339. World War II****3 Credits**

Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement.

**HIST 340. American Economic History****3 Credits**

The rise of big business and organized labor, increasing price rigidities, and growing government intervention. Same as ECON 340.

**HIST 342. Early American Military History****3 Credits**

Emphasis on American wars up to and including the Civil War, and on the factors contributing to the development of modern military systems.

**HIST 343. Recent American Military History****3 Credits**

Emphasis on American wars since the Civil War, and on factors contributing to the development of modern military systems.

**HIST 346. The Jacksonian Era 1800-1840****3 Credits**

Jeffersonian period, War of 1812. Social, political, and economic history of the Jacksonian era.

**HIST 347. Civil War Era 1840-1877****3 Credits**

Mexican-American War, development of secession, American Civil War, Reconstruction.

**HIST 353. Colonial Mexico****3 Credits**

Covers major social, political, economic and cultural topics including pre-Columbian civilizations, early European incursions and indigenous responses, economic systems and labor exploitation, religion and spirituality, and resistance to colonial rule. Sixteenth to nineteenth centuries.

**HIST 354. Modern Mexico****3 Credits**

Examines interactions of peasants, women, indigenous peoples, and economically/politically dominant groups within the Mexican state from 1810 to the present. Assesses the contentious relationship between Mexico and the United States, focusing on the Mexican-U.S. border.

**HIST 356. The Mexican Revolution****3 Credits**

Examines the history of modern Mexico through the lens of the Mexican Revolution, 1910-1920. Course covers military, political, social, cultural and economic developments that shaped Mexico during and after the Revolution.

**HIST 361. Afro-American History I****3 Credits**

African background, slave trade, slavery; Civil War and Reconstruction; free blacks in a white society to about 1900.

**HIST 362. Afro-American History II****3 Credits**

Black Americans in the United States in the twentieth century; segregation; black leaders, organizations, methods and goals; white reaction; the struggle for equality.

**HIST 366V. British Imperialism****3 Credits**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

**HIST 368. Teaching History****3 Credits**

Philosophical and practical issues of teaching history are explored. Designed to help prospective teachers at all levels clarify their views about studying history. A variety of pedagogical strategies for teaching history are explored.

**HIST 369. History of Latinos in the United States****3 Credits**

Development of Latino communities since 1500 in what is today the U.S. Emphasis on 1846 to present, and on Mexican Americans, Puerto Ricans, and Cuban Americans. Major themes: race, colonialism, immigration, nationalism, class, culture, gender, and politics.

**HIST 371. Ancient Greece****3 Credits**

Social, cultural, and political history of Greece from the Minoan to Hellenistic periods.

**HIST 372. The Roman World****3 Credits**

Republic and Empire; Rome as a world power; institutional, cultural, and intellectual contributions; decline and fall.

**HIST 373. Islam and the West: Cultural Contacts, Conflicts and Exchanges****3 Credits**

Examines interactions, encounters and cross-fertilization between the Islamic world and the West from the seventh to the twenty-first centuries. Course includes origins of Islam, relationships between Islam, Judaism, and Christianity, and concludes with the post 9/11 present.

**HIST 374V. The European City: History and Culture****3 Credits**

Course presents the rich, complex history and cultures of European cities from ancient to modern times, linking these cities to crucial issues in European history. Crosslisted with HON 374V, GEOG 374V, GOVT 374V.

**HIST 376. Great Battles That Shaped Europe****3 Credits**

Considers the most significant battles in the West from the 13th century BCE (Troy) to the 16th century CE (Spanish Armada).

**HIST 382V. Modern Russia****3 Credits**

Domestic policies and foreign relations from mid-nineteenth century to the present with emphasis on the Soviet period.

**HIST 383. Germany****3 Credits**

Political, social, and cultural developments from the eighteenth century to the present, with emphasis on the Nazi era. Same as GOVT 473.

**HIST 386. New Mexico History****3 Credits**

Economic, political and social development of New Mexico from exploration to modern times.

**HIST 387. Spain****3 Credits**

From pre-Roman times to the modern era.

**HIST 390V. The Holocaust****3 Credits**

The attack upon European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession to chancellor in 1933 until the end of the Third Reich in 1945.

**HIST 391. Twentieth Century World History****3 Credits**

Includes globalization; imperialism; World Wars I and II and the changing roles of Europe: the Cold War; decolonization; the rise and collapse of Communism; new social and intellectual movements; and the growing roles of East Asia, India, Latin America, Africa and the Middle East. Thematic examples.

**HIST 392. Tudor-Stuart England, 1485-1715****3 Credits**

British history from 1485-1715, including the development of the monarchy and Parliament, the Protestant Reformation, the English Civil War and Restoration, and culture and society.

**HIST 394. Victorian and Edwardian Britain, 1815-1914****3 Credits**

Evolution of constitutional monarchy; industrialism and imperialism; repose and reform; increased influence of an intellectual elite and the emergence of the Labor Party.

**HIST 395. From Rule Britannia to Cool Britannia: Twentieth-Century Britain****3 Credits**

Edwardian Era, World War I; Reconversion, the 1926 General Strike; the Great Depression and appeasement; Churchill and the war against Nazi Germany; nationalization and the Welfare State.

**HIST 397. Introduction to Public History****3 Credits**

Surveys how historians do history in museums, archives, government agencies, and in communities. Hands-on experience provides students a better understanding of history and how historians work outside of the classroom. Seminar project required.

**HIST 398. Historians and History****3 Credits**

General historiography and philosophy of history; historical methodology, research, and writing; bibliographical aids and their uses. May be repeated up to 3 credits. Restricted to: HIST majors.

**HIST 399. New Mexico Law****3 Credits**

Same as GOVT 399, C J 399, JOUR 399, and SOC 399.

**HIST 400. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

**HIST 402. Special Topics in European History****3 Credits**

Special topics in European history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 403. Special Topics in Middle Eastern History****3 Credits**

Special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 404. Special Topics in Asian History****3 Credits**

Special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 406. Special Topics in United States History****3 Credits**

Special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 408. Cultures of Africa****3 Credits**

Explores the rich history and cultural diversity of the continent of Africa. The course first examines the historical processes that have shaped modern Africa, including the evolution of modern humans in Africa, the origins of agriculture and pastoralism, the formation of indigenous African states, the slave trade, and European colonialism. The course also looks at contemporary African societies, including hunter-gatherer, pastoral, and farming/fishing peoples. In addition, contemporary issues facing modern Africa such as famine and agricultural policy, the status of women, and environmental changes such as deforestation are discussed. Crosslisted with: ANTH 404

**HIST 410. New Mexico History for Educators****3 Credits**

Course provides content and innovative techniques for teachers of New Mexico history. Covers pre-contact Native American history through Spanish Colonial and Mexican periods through the twentieth century.

**HIST 411. Making the American West****3 Credits**

This seminar course explores the history of disease, dying, death and funeral practices, and may include such topics as the social and cultural histories of murder, suicide, epidemics, death in wartime, the death penalty, and/or the corpse. The class may be taught with a different national or chronological focus in different semesters. Crosslisted with: HIST 513.

**HIST 412. Travel Writing****3 Credits**

Explores how writers describe their travels with an emphasis on the history of a place. Semester paper required. Crosslisted with: HIST 512.

**HIST 413. Native American History****3 Credits**

Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

**HIST 417. The Mongol Empire****3 Credits**

Examines the history and legacy of the Mongol World Empire founded by Chinggis Khan and his sons, and the dynasties that came to dominate Inner Asia in its wake. Crosslisted with: HIST 517.

**HIST 419. Central Asia****3 Credits**

An introduction to the political, cultural and social history of the Central Asian region from pre-history to the present, including coverage of the empires of the Mongols, Tamerlane and their successors. Crosslisted with: HIST 519.

**HIST 423. The History of Food****3 Credits**

Considers the history of the production and consumption of food in the West from the Neolithic Age to the present with an emphasis on the historical relationships between food, gender, social class, social identity and nationalism. Crosslisted with: HIST 523.

**HIST 424. History of Art, Thought and Literature****3 Credits**

Seminar discusses a variety of artistic and literary expressions in their historical contexts and focuses on the ways in which cultural forms both reflect and construct the broader historical trends that surround them.

**HIST 425V. History of Magic and Witchcraft in Medieval and Renaissance Europe****3 Credits**

Examines history of popular and scientific beliefs about magic and witchcraft in medieval and early modern Europe. Includes origins of occult Western sciences; Arabic sources of medieval magic; the occult sciences in scholasticism; witchcraft and scholasticism; witchcraft and medieval theology, witch hunts of the 16th and 17th centuries; and the decline of belief in magic and witchcraft. Emphasis on boundaries that defined and separated magic, science, and religion in Western thought from late antiquity through the Scientific Revolution. Crosslisted with: HON 425.

**HIST 428. History of Terrorism in Modern Europe and the Middle East****3 Credits**

Analyzes causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas and Hezbollah in the contemporary Middle East and beyond.

**HIST 431. History of Race and Ethnicity****3 Credits**

Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.

**HIST 432. United States Labor History to 1877****3 Credits**

Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 433. United States Labor History Since 1877****3 Credits**

Seminar discussions explore United States labor and working-class history since 1877, including such topics as industrial labor, debt peonage, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 434. Urban History****3 Credits**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

**HIST 435. History of War and Revolution****3 Credits**

Seminar covers historical dynamics of violent social, political, and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

**HIST 436. Nations and Nationalism****3 Credits**

Seminar examines major theories of nationalism from the nineteenth century to the twenty-first century. Course includes nationalist case studies, from liberal nationalist state-building to ethnic cleansing in the Balkans.

**HIST 438. Antiquity and Modernity****3 Credits**

Seminar explores links between earlier and more recent historical periods. Examples may include the Renaissance rediscovery of ancient Rome or the early modern Chinese reassessment of its classical Confucian heritage. Readings include ancient sources and the modern reception of such works, and the scholarly assessment of these processes. Individual research projects required in areas of student interests.

**HIST 443. The Cold War in Latin America****3 Credits**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

**HIST 448. Nuclear Nation****3 Credits**

Explores post-World War II history and the impact atomic energy has had on the United States and the world.

**HIST 449. Readings****1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**HIST 453. Cuba: Colony to Castro****3 Credits**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean with emphasis on recent events.

**HIST 459. Peru: From Incas to Inca Kola****3 Credits**

Explores issues of cultural and national identity in Peru from the Incas to the present, focusing on the modern period. Themes include indigenous resistance and adaptation to colonial rule, nationalism, militarism, terrorism, globalization, and the drug trade. Same as ANTH 459 and GOVT 465.

**HIST 471. China through the Ming Dynasty****3 Credits**

History of China from origins to Ming dynasty, (1368-1644). Cultural and political development with emphasis on social and economic contexts and long term trends.

**HIST 472. China in the Modern World****3 Credits**

History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.

**HIST 473. History of Japan****3 Credits**

History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.

**HIST 474. Gender in East Asian History****3 Credits**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as W S 474.

**HIST 475. History of the Global Political Economy****3 Credits**

Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

**HIST 479. Oral History****3 Credits**

Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.

**HIST 481. Time Traveling Through New Mexico's Past****3 Credits**

Teaches historians and educators how to make history come alive. Semester project includes role playing characters and activities from a past era with local schools and museums.

**HIST 483. Historic Preservation****3 Credits**

Study of community development, the historic preservation movement, and the built environment. Field project.

**HIST 486. Interpreting Historic Places for the Public****3 Credits**

Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

**HIST 489. Projects in History****3 Credits**

Individual projects in history. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**HIST 500. Special Topics****1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated for a maximum of 12 credits.

**HIST 503. The Jacksonian Era, 1800-1840****3 Credits**

Jeffersonian period, War of 1812. Social, political, and economic history of the Jacksonian era. Graduate research paper required.

**HIST 504. Civil War Era, 1840-1877****3 Credits**

Mexican-American War, development of secession, American Civil War, Reconstruction. Graduate research paper required.

**HIST 507. The History of Food****3 Credits**

Considers the history of the production and consumption of food in the West from the Neolithic Age to the present, with an emphasize on the historical relationships between food, gender, social class, social identity and nationalism. Crosslisted with: HIST 423.

**HIST 509. Native American History****3 Credits**

Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans, and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

**HIST 510. New Mexico History for Educators****3 Credits**

Course provides advanced content and innovative techniques for teachers of New Mexico history. Covers pre-contact Native American history through Spanish Colonial and Mexican periods through the twentieth century.

**HIST 511. Making the American West****3 Credits**

Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.

**HIST 512. Travel Writing****3 Credits**

Explores how writers describe their travels with an emphasis on the history of a place. Semester paper required. Crosslisted with: HIST 412.

**HIST 513. American Social and Cultural History to 1900****3 Credits**

This seminar course explores the history of disease, dying, death and funeral practices, and may include such topics as the social and cultural histories of murder, suicide, epidemics, death in wartime, the death penalty, and/or the corpse. The class may be taught with a different national or chronological focus in different semesters. Crosslisted with: HIST 411.

**HIST 516. History of Latinos in the United States****3 Credits**

Development of Latino communities since 1500 in what is today the United States. Emphasis on 1846 to present, and on Mexican Americans, Puerto Ricans, and Cuban Americans. Major themes: race, colonialism, immigration, nationalism, class, culture, gender, and politics. Graduate research paper required.

**HIST 517. U.S. Immigration from the Caribbean since 1868****3 Credits**

Examines the history and legacy of the Mongol World Empire founded by Chinggis Khan and his sons, and the dynasties that came to dominate Inner Asia in its wake. Crosslisted with: HIST 417.

**HIST 518. From the Wild West to the Atomic West****3 Credits**

Explores the transformation of the West, with particular attention to the roles of race, class, gender, and culture. Includes extra class meetings to view feature-length films. Graduate research paper required.

**HIST 519. History of Women in the American West****3 Credits**

An introduction into the political, cultural and social history of the Central Asian region from pre-history to the present, including coverage of the empires of the Mongols, Tamerlane and their successors. Crosslisted with: HIST 419.

**HIST 524. Art, Thought and Literature****3 Credits**

Seminar discusses a variety of artistic and literary expressions in their historical contexts and focuses on the ways in which cultural forms both reflect and construct the broader historical trends that surround them.

**HIST 525. History of Magic and Witchcraft in Medieval and Renaissance Europe****3 Credits**

Examines history of popular and scientific beliefs about magic and witchcraft in medieval and early modern Europe. Includes origins of occult Western sciences; Arabic sources of medieval magic; the occult sciences in scholasticism; witchcraft and scholasticism; witchcraft and medieval theology, witch hunts of the 16th and 17th centuries; and the decline of belief in magic and witchcraft. Emphasis on boundaries that defined and separated magic, science, and religion in Western thought from late antiquity through the Scientific Revolution. May be repeated up to 3 credits.

**HIST 527. Labor History****3 Credits**

Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 528. History of Terrorism in Modern Europe and the Middle East****3 Credits**

Advanced analyses of causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas, and Hezbollah in the contemporary Middle East and beyond.

**HIST 535. War and Revolution****3 Credits**

Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

**HIST 536. Nations and Nationalism****3 Credits**

Seminar examines major theories of nationalism from the nineteenth to the twenty-first centuries. Course includes nationalist case studies, from liberal nationalist state-building to ethnic cleansing in the Balkans.

**HIST 538. Special Topics in European History****3 Credits**

Advanced special topics in European history to be announced in the schedule of classes. May be repeated for a maximum of 12 credits.

**HIST 540. Special Topics in Middle Eastern History****3 Credits**

Advanced special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 543. Special Topics in Asian History****3 Credits**

Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 545. Special Topics in United States History****3 Credits**

Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**HIST 546. World War I****3 Credits**

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war. Graduate research paper required.

**HIST 548. Nuclear Nation****3 Credits**

Explores post-World War II history and the impact that atomic energy has had on the United States and the world.

**HIST 549. Graduate Readings****1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**HIST 549 L. Splendors of Imperial China****1 Credit**

This course consists of a FLIP trip to China, Fall 2014 which will explore the significant sites of imperial Chinese culture by spending 14 days traveling in China. Consent of Instructor required. Crosslisted with: HIST 323 L and ART 511 L.

**HIST 551. Colonial Mexico****3 Credits**

Political, economic, and social development from the Aztecs to 1821. Graduate research paper required.

**HIST 552. Modern Mexico****3 Credits**

From independence to the present, with emphasis on the Revolution. Graduate research paper required.

**HIST 553. Cuba: Colony to Castro****3 Credits**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean, with emphasis on recent events. Graduate research paper required.

**HIST 557. The Mexican Revolution****3 Credits**

Origins, causes, and scope of the Mexican Revolution, including leading personalities, with emphasis on the U.S.-Mexican border. Graduate research paper required.

**HIST 559. Peru: From Incas to Inca Kola****3 Credits**

Crosslisted with: ANTH 559 and GOVT 565

**HIST 560. History of Egypt****3 Credits**

Advanced study of history of Egypt from ancient through modern times. Includes the study of Egypt's interactions with the Middle East and the West, as well as its legacy for both civilizations.

**HIST 561. Islam and the West: Cultural Contacts, Conflicts and Exchanges****3 Credits**

Examines interactions, encounters and cross-fertilization between the Islamic world and the West from the seventh to the twenty-first centuries. Course includes origins of Islam, relationships between Islam, Judaism, and Christianity, and concludes with the post 9/11 present. May be repeated up to 3 credits.

**HIST 566. British Imperialism****3 Credits**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

**HIST 568. Urban History****3 Credits**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

**HIST 570. The Cold War in Latin America****3 Credits**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

**HIST 571. China through the Ming Dynasty****3 Credits**

History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.

**HIST 572. China in the Modern World****3 Credits**

Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required.

**HIST 573. History of Japan****3 Credits**

Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.

**HIST 574. Gender in East Asian History****3 Credits (3+2P)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature (in translation) and cinema used. Same as W S 574.

**HIST 575. History of the Global Political Economy****3 Credits**

Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

**HIST 576. The Holocaust****3 Credits**

Advanced study of the attack on European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession as chancellor in 1933 until the end of the Third Reich in 1945.

**HIST 578. Modern Russia****3 Credits**

Domestic policies and international relations from the mid-nineteenth century to the present with emphasis on the Soviet experience.

**HIST 579. Oral History****3 Credits**

Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.

**HIST 580. Graduate Research Projects****1-6 Credits (1-6)**

Intensive investigation of a selected area of history, including the completion of a research paper or a public history project. Consent of instructor required.

**HIST 581. Time Traveling Through New Mexico's Past****3 Credits**

Instructs historians and educators on how to make history come alive. Semester project includes role playing characters and activities from a past era with local schools and museums.

**HIST 582. History and Memory****3 Credits**

Seminar examines the interplay of memory and history. Explores how various nations and people construct the narratives of their past.

**HIST 583. Advanced Historic Preservation****3 Credits**

Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.

**HIST 585. Public History Internship****3 Credits**

Individual project in an area of public history, including a final written report. Research project required. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**HIST 586. Interpreting Historic Places for the Public****3 Credits**

Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

**HIST 587. United States Labor History to 1877****3 Credits**

Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

**HIST 588. United States Labor History since 1877****3 Credits**

Seminar discussions explore United States labor and working-class history since 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude and housework. May explore the history of labor organization, working-class culture and leisure activities and responses to labor issues by the state.

**HIST 590. Reading Seminar: Borders, Boundaries and Frontiers****3 Credits**

Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program.

**HIST 591. Reading Seminar: Modernity and its Discontents****3 Credits**

Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.

**HIST 592. Reading Seminar: Nature and Society****3 Credits**

Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.

**HIST 593. Reading Seminar: History, Myth and Memory****3 Credits**

Course analyzes the complex and often contested process of writing national histories, creating national heroes, and forging collective memories. Students assess written texts, memorials, parades and celebrations.

**HIST 594. Public History Seminar****3 Credits**

Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.

**HIST 596. Research Seminar****3 Credits**

Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.

**HIST 597. Public History Article****1-9 Credits (1-9)**

Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.

**HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f)****3 Credits**

Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.

**HIST 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

## HIT-HEALTH INFO TECHNOLOGY (HIT)

**HIT 110. Electronic Health Records****3 Credits**

Current electronic health record principles, methods and procedures, and computerized medical record concepts and software applications will be introduced. Restricted to: Community Colleges only.

**Prerequisite(s):** C S 110 or OECS 105.

**HIT 120. Health Information Introduction to Pharmacology****3 Credits**

Introduction to the principles of pharmacology, including drug terminology; drug origins, forms, and actions; routes of administration; as well as the use of generic name drugs, trade name drugs and categories of drugs to treat multiple and specific body systems.

**HIT 130. Health Information Technology Anatomy & Physiology****3 Credits**

An introductory course in the basics of human structure and function. Body systems are examined as to how they relate to proper code selection and as part of the functioning of the body as a whole. Restricted to Community Colleges campuses only.

**HIT 140. Health Information Introduction to Pathophysiology  
3 Credits**

Introduction to the nature of disease and its effect on body systems. Disease processes affecting the human body via an integrated approach to specific disease entities will be presented including a review of normal functions of the appropriate body systems. Diseases will be studied in relation to their etiology, pathology, physical signs and symptoms, diagnostic procedures, complications, treatment modalities and prognosis.

**HIT 150. Introduction to Medical Terminology  
3 Credits**

The study and understanding of medical terminology as it relates to diseases, their causes and effects, and the terminology used in various medical specialties. Emphasis will be placed on learning the basic elements of medical words, appropriate spelling and use of medical terms, and use of medical abbreviations. Restricted to: Community Colleges only.

**HIT 158. Advanced Medical Terminology  
3 Credits**

Builds upon the concepts covered in HIT 150 or AHS 120 providing greater understanding of how to properly use and apply medical terminology used in the various health fields. Medical terminology associated with the body system's anatomy and physiology, pathology, diagnostic and therapeutic procedures, pharmacology, and abbreviations will be emphasized. Restricted to Community Colleges campuses only.  
**Prerequisite(s):** HIT 150 or AHS 120.

**HIT 221. Internship I  
1-3 Credits (1-3)**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: HIT & BOT majors. S/U Grading (S/U, Audit). Restricted to Dona Ana campus only.

**HIT 228. Medical Insurance Billing  
3 Credits**

Comprehensive overview of the insurance specialist's roll and responsibilities. Concepts and applications that will assist the student in understanding the steps necessary for successfully completing the insurance claim filing and reimbursement processes for various insurance carriers, both private and government, will be emphasized. Restricted to Carlsbad campus only.

**Prerequisite(s):** HIT/NURS 150; BOT 208.

**HIT 240. Health Information Quality Management  
3 Credits**

Introduction to basic concepts of quality improvement and performance improvement as they apply to health record systems and the health care industry. Quality assessment and improvement standards and requirements of licensing, accrediting fiscal and other regulatory agencies will be presented.

**HIT 248. Medical Coding I  
3 Credits (2+2P)**

Comprehensive overview of the fundamentals, coding conventions, and principles of selecting the most appropriate ICD-10-CM/PCS diagnostic and procedure codes. The most recent version of ICD-10-CM/PCS and an in depth study of current Official Coding Guidelines for coding and reporting will be emphasized. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BOT 228.

**HIT 255. Special Topics  
3 Credits**

Specific topics to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**HIT 258. Medical Coding II  
3 Credits (2+2P)**

Continuation of Medical Coding I. Comprehensive overview of the coding and reporting guidelines, fundamentals, coding conventions, and principles of selecting the most appropriate CPT and HCPCS procedural codes for all medical specialties. The most recent version of CPT and a continued study of the ICD-10-CM/PCS coding conventions and principles will be emphasized. Designed as a medical coding capstone course. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HIT 248.

**HIT 268. Health Information Systems  
3 Credits**

Overview of health data management, work planning, and organization principles; an introduction to health care information systems; and review of the fundamentals of information systems for managerial, clinical support, and information systems.

## HNDS-HUMAN NUTRITION & DIET (HNDS)

**HNDS 201. Seminar 1- The Field of Dietetics  
1 Credit**

This course will introduce students to the field experience, careers, and professions in nutrition. This course is required for students pursuing a Didactic Program in Dietetics verification statement. May be repeated up to 1 credits. Consent of Instructor required. Restricted to: HNDS majors. Restricted to Las Cruces and Dona Ana campuses.

**HNDS 251. Human Nutrition  
3 Credits**

Principles of normal nutrition. Relation of nutrition to health. Course contains greater amounts of chemistry and biology than HNDS 163. Open to nonmajors.

**HNDS 300. Special Topics  
1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**HNDS 350. Nutrition Throughout the Lifecycle  
3 Credits**

Relationship of the stages of the human life cycle to changes in nutrient need.

**Prerequisites:** (BIOL 254 or BIOL 226 or SP M 371) and HNDS 251, or consent of instructor.

**HNDS 360. Food for Health****4 Credits**

This course is designed to provide students the opportunity to learn about the intersection of nutrition and health in terms of food and diet. Students will be introduced to basic concepts within nutrition education, nutrition communication, nutrition and health and food culture.

**Prerequisite(s):** FSTE 263; HNDS 251.

**HNDS 363. Quantity Food Production and Service****6 Credits (1+10P)**

Covers quantity food production including cooking concepts, sanitation and safety, teamwork, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe or NM Food Handler certification required. May be repeated up to 6 credits. Crosslisted with: HRTM 363.

**Prerequisite(s):** HRTM 263.

**HNDS 401. Field Experience- Clinical Dietetics****1-8 Credits (1-8)**

Experience in various areas of clinical nutrition facilities with emphasis on nutrition care of patients. Practical experience with supervision by resident faculty as well as supervisor at work site. Performance at work site graded in accordance with university standards. May be repeated for a maximum of 8 credits. Consent of instructor required. Restricted to: Main campus only.

**Prerequisite(s):** HNDS 201, overall GPA of 2.5 or higher and junior or senior standing and consent of instructor.

**HNDS 403. Community Nutrition****3 Credits**

Overview of the practice of community nutrition. Includes program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community.

**Prerequisite:** HNDS 350 or consent of instructor.

**HNDS 405. Seminar II- Entering the Field of Dietetics****1 Credit**

Students will develop professional materials that will be used in their future careers including a personal statement, curriculum vitae, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered. Consent of Instructor required. Crosslisted with: HNDS 505. Restricted to: HNDS majors.

**Prerequisite(s):** Students must be enrolled in their last fall semester prior to planned graduation from the DPD program; HNDS 201, HNDS, 251, HNDS 350.

**Corequisite(s):** HNDS 403, HNDS 446, AND HNDS 448.

**HNDS 407. Field Experience Community Nutrition****1-8 Credits**

Experience working with nutritional problems of individual families of all socioeconomic and age levels and with agencies concerned with community nutrition. Practical experience with supervision by resident faculty as well as supervisor at the work site. Performance at work site graded in accordance with university standards. May be repeated for a maximum of 8 credits. Restricted to majors.

**Prerequisites:** HNDS 201, overall GPA of at least 2.5 and junior or senior standing or consent of instructor.

**HNDS 409. Dietetic Science Capstone****3 Credits**

This course will provide a cumulative review and assessment of the foundational knowledge, concepts, and skills presented throughout the didactic program in nutrition and dietetics to ensure readiness to proceed within the field of dietetics. Students will apply professional skills to prepare them for their future careers. Students will also be guided through the dietetic internship application process. Consent of Instructor required. Crosslisted with: HNDS 509. Restricted to: Dietetics Option majors.

**Prerequisite(s):** Students must be enrolled in their last spring semester prior to planned graduation from the DPD program.

**HNDS 410. Sports Nutrition****3 Credits**

Role of nutrition in physical performance of competitive and recreational sports participants.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 420. Nutrition Counseling and Communication****3 Credits**

This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education. Consent of Instructor required.

**Prerequisite(s):** HNDS 251, HNDS 350.

**HNDS 430. Food Service Organization and Management****3 Credits**

Personnel, financial and general management in institutional and commercial food service operations.

**Prerequisite:** junior/senior standing or consent of instructor.

**HNDS 440. Nutrition Education and Research****3 Credits**

Course will enable students to apply general education and research knowledge to the field of nutrition. Nutrition information will be applied to education topics including learning objective development, backwards design of curriculum, student centered learning and learning assessment. Crosslisted with: HNDS 540.

**Prerequisite(s)/Corequisite(s):** HNDS 251, 350, and 360.

**HNDS 446. Diet Therapy I****3 Credits**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 446 L. Diet Therapy I Laboratory****1 Credit**

Supplements HNDS 446. Students will perform nutrition assessments, nutrition focused physical exams, apply medical nutrition therapy-based interventions and practice patient discharge education for specific disease states. Must be taken with HNDS446. Restricted to: HNDS majors.

**Corequisite(s):** HNDS 446.

**HNDS 448. Advanced Nutrition****3 Credits**

Application of biochemistry and physiology to nutrition. Restricted to: Main campus only.

**Prerequisite(s):** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 449. Diet Therapy II****3 Credits**

Continuation of HNDS 446.

**Prerequisite:** HNDS 446 or consent of instructor.

**HNDS 449 L. Diet Therapy II Laboratory****1 Credit**

Supplements HNDS 449. Students will apply medical nutrition therapy to specific disease states with special emphasis on writing nutrition support orders and learning to utilize nutrition support equipment. Must be taken with HNDS449. Restricted to: HNDS majors.

**Corequisite(s):** HNDS 449.

**HNDS 450. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**HNDS 455. Billing and Coding for Dietetics****3 Credits**

This course provides students with an overview of billing and coding practices for medical nutrition therapy that ensure proper reimbursement for services. Students will learn nutrition related billing codes, apply nutrition care process terminology to documentation, and discover how policy affects current and future coverage of nutrition services. Crosslisted with: HNDS 555.

**Prerequisite(s):** HNDS 446, HNDS 449.

**HNDS 492. Special Problems****1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits.

**HNDS 500. Orientation to Dietetic Internship****3 Credits**

Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship program.

**HNDS 501. Advanced Animal Nutrition (so)****3 Credits**

Same as ANSC 501.

**HNDS 507. Laboratory Techniques in Nutrition****4 Credits (2+6P)**

Methodology and experimental procedures in measuring nutrient requirements and values of diets. Same as ANSC 507.

**Prerequisites:** ANSC 422 or consent of instructor.

**HNDS 509. Dietetic Science Capstone****3 Credits**

This course will provide a cumulative review and assessment of the foundational knowledge, concepts, and skills presented throughout the didactic program in nutrition and dietetics to ensure readiness to proceed within the field of dietetics. Students will apply professional skills to prepare them for their future careers. Students will also be guided through the dietetic internship application process. Consent of Instructor required. Crosslisted with: HNDS 409.

**Prerequisite(s):** Students must be enrolled in their last semester of the DPD program.

**HNDS 510. Graduate Study in Sports Nutrition****3 Credits**

Role of nutrition and nutrients in physical performance of competitive and recreational sports participants. Additional work required at the graduate level.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 512. Research Methods in Animal Science****4 Credits**

Same as ANSC 512.

**HNDS 517. Graduate Seminar****1 Credit**

Current topics. Same as ANSC 515.

**Prerequisite:** consent of instructor.

**HNDS 522. Animal Nutrition (f)****3 Credits**

Same as ANSC 522.

**HNDS 530. Graduate Studies in Food Service Organization and Management****3 Credits**

Personnel, financial, and general management in institutional and commercial food service operations. Additional work required at the graduate level.

**HNDS 546. Diet Therapy I****3 Credits**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond HNFS 446 required for students registering in HNDS 546.

**Prerequisites:** BIOL 254, BCHE 341, and HNDS 251, or consent of instructor.

**HNDS 548. Graduate Studies in Advanced Nutrition****3 Credits**

Covers biochemistry and physiology applied to nutrition. Students enrolled in the 500-level class will be required to complete additional assignments beyond what is required for HNDS 448. Restricted to: Main campus only.

**HNDS 549. Diet Therapy II****3 Credits**

Continuation of HNDS 546.

**Prerequisites:** HNDS 546 or consent of instructor.

**HNDS 551. Graduate Study in Community Nutrition****3 Credits**

Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Additional work required at the graduate level.

**Prerequisite(s):** HNDS 350 or consent of instructor.

**HNDS 560. Dietetic Intern Seminar****1 Credit**

Portfolio development for dietetic interns during supervised practice rotations. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Acceptance into the NMSU dietetic internship.

**HNDS 562. Dietetic Internship: Supervised Practice in Community Nutrition****1-8 Credits (2-6P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in community nutrition to include an emphasis in Cooperative Extension Service. Dietetic interns work under the the guidance of faculty and community nutrition professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNFS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 563. Community Nutrition for Dietetic Interns****3 Credits**

Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. Consent of instructor required. Restricted to HNDS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 564. Dietetic Internship: Supervised Practice in Food Service Management****1-5 Credits (2-10P)**

Provides dietetic interns with a minimum of 300 clock hours of supervised practice in foodservice management. Dietetic interns work under the guidance of faculty and foodservice management professionals. Students must complete a total of 4 credit hours of HNDS 564. May be repeated up to 5 credits. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 565. Foodservice Management for Dietetic Interns****3 Credits**

Advanced topics in foodservice systems management to include business planning and marketing. Consent of Instructor required. Restricted to: HNFS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 566. Dietetic Internship: Supervised Practice in Clinical Dietetics****1-8 Credits (2-16P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. May be repeated up to 8 credits. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 567. Nutrition Care Process for Dietetic Interns****3 Credits**

Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of instructor required. Restricted to HNDS majors.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 568. Review Course for National RD Exam****3 Credits**

Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. Consent of Instructor required.

**Prerequisite(s):** Acceptance into Dietetic Internship.

**HNDS 590. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

**HNDS 598. Special Research Programs****1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**HNDS 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)****4 Credits**

Same as ANSC 626.

## HON-HONORS (HON)

**HON 115. Journeys of Discovery****1 Credit**

Weekly conversations among students and a faculty member; organized around a particular subject and a small selection of readings. The seminars illuminate the many paths of discovery explored by the New Mexico State University faculty.

**Prerequisite(s):** Honors eligible.

**HON 205G. Life, Energy, and Evolution****4 Credits (3+3P)**

Principles of modern biological science with discussion on the impact of this science in today's world. Selected topics include principles of metabolism, genetics, physiology, evolution, and ecology. Students who pass HON 205G will fulfill the same requirements fulfilled by BIOL 111G and BIOL 111GL.

**HON 208G. Music in Time and Space****3 Credits**

Survey of music as it interacts with art, mathematics, science (acoustics), and ideas from exotic cultures through the history of Western civilization.

**HON 214. Successful Fellowship Writing****1 Credit**

Same as HON 314, for freshmen and sophomores.

**HON 216G. Encounters with Art****3 Credits**

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.

**HON 218. Women Across Cultures****3 Credits**

Historical and critical examination of women's contributions worldwide with emphasis on the issues of representation that have contributed to exclusion and marginalization of women and their achievements.

Restricted to: Main campus only. Crosslisted with: W S 202G

**HON 219G. Earth, Time, and Life****4 Credits (3+3P)**

Covers how the earth's materials form, processes involved in changing the earth's configuration, and extent of people's dependence upon the earth's resources. Includes mineral and energy resources, development of landscapes, environmental problems, evolution of the earth and life forms. May be taken in place of GEOL 111G.

**HON 220G. The World of the Renaissance: Discovering the Modern****3 Credits**

An introduction to the literature and thought of Renaissance Europe. Humanism and the Reformation will be approached through the intensive study of major writers such as Petrarch, Machiavelli, Luther, Erasmus, Montaigne, and Shakespeare. Restricted to Las Cruces campus only.

**HON 222G. Foundations of Western Culture****3 Credits**

Critical reading of seminal texts relating to the foundations of culture and values in Western civilization, from ancient Greece to about 1700. Focus on the development of concepts of nature, human nature, and the state.

**HON 227G. Plato and the Discovery of Philosophy****3 Credits**

Examines arguments and theories found in the Platonic dialogues with a view to determining the nature and value of philosophy both from Plato's point of view and absolutely.

**HON 228G. Religion and the State****3 Credits**

Moral and political questions that arise in connection with church-state relations, including religious toleration, separation of church and state, the individual's moral duty to ignore religious convictions when performing functions of democratic citizenship, and the extent to which these ideas are embodied in our nation's traditions.

**HON 229G. The New Testament as Literature****3 Credits**

Literature of the New Testament examined from a literary perspective. Emphasis on translation history of the New Testament, generic features of gospel, epistle and apocalypse, precedent literary models, problems of authorship, classification of New Testament texts.

**HON 230G. Bamboo and Silk: The Fabric of Chinese Literature****3 Credits**

Introductory survey of traditional and modern Chinese prose and poetry in translation with emphasis on genre, theme, and social/historical context.

**HON 232G. The Human Mind****3 Credits**

Examination of the current understanding of the intricate relationship between mind and matter, with particular emphasis on the functional organization of the human brain. Evolutionary origins of this functional design and its implications for understanding human emotional and cognitive processes.

**HON 233. Social Problems****3 Credits**

Introduction to contemporary social problems from multiple perspectives. Discussions of definition, impact, and prospective solutions to major social issues, such as crime, drug abuse, social inequality, family, population, environment, and social change.

**HON 234G. The Worlds of Arthur****3 Credits**

Arthurian texts and traditions from medieval chronicle histories to modern novels. Emphasis on both the continuities of the Arthurian tradition and the diversity of genres, media, and cultures that have given expression to the legend.

**HON 235G. Window on Humanity****3 Credits**

Anthropology is the most humanistic of the sciences, and the most scientific of the humanities. This course will use anthropological perspectives to examine the human experience from our earliest origins, through the experiences of contemporary societies. We will gain insights into the influence of both culture and biology on shaping our shared human universals, and on the many ways in which human groups are diverse. Restricted to Las Cruces campus only.

**HON 237G. Archaeology: Search for the Past****3 Credits**

A critical evaluation of various approaches to understanding prehistory and history. The methods and theories of legitimate archaeology are contrasted with fantastic claims that invoke extraterrestrials, global catastrophes, transoceanic voyages, and extra-sensory perception. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**HON 239G. Medieval Understandings: Literature and Culture in the Middle Ages****3 Credits**

Intensive, interdisciplinary introduction to the thought and culture of medieval Europe. Core texts will include works by St. Augustine, Marie de France, and Dante, as well as anonymous works such as Sir Gawain and the Green Knight, all supplemented by study of medieval art, architecture, philosophy, and social history.

**HON 242G. Claiming an American Past****3 Credits**

Survey of history of the United States in the nineteenth and twentieth centuries, with an emphasis on multicultural social and cultural history. Focus on understanding American history from the point of view of dispossessed, impoverished, and disenfranchised Americans who have fought to claim both their rights as Americans and American past.

**HON 248G. The Citizen and the State: Great Political Issues****3 Credits**

The fundamental questions of politics: why and how political societies are organized, what values they express, and how well they satisfy those normative goals and the differing conceptions of citizenship, representation, and freedom.

**HON 249G. American Politics in a Changing World****3 Credits**

American politics and policies examined from a historical and global perspective. Philosophical underpinnings of American national government, the structure of government based on that philosophy, and the practical implications of both the philosophical and structural base. How American government influences and is influenced by the world community.

**HON 265G. Principles of Human Communication Honors****3 Credits**

Study and practice of interpersonal, small group, and presentational skills essential to effective social, business, and professional interaction.

**HON 270G. Theatre: Beginnings to Broadway****3 Credits**

Intercultural and historical overview of live theatre production and performance, including history, literature and professionals. Students attend and report on stage productions.

**HON 304V. Dilemmas of War and Peace****3 Credits**

A multi-disciplinary introduction to war, peace, and world order studies. The origins of war and the foundations of peace are explored in the context of a rapidly changing world order.

**HON 305V. Global Environment****3 Credits**

Covers global environmental problems with focus on causes and possible solutions.

**HON 306V. Science, Ethics and Society****3 Credits**

Investigation of the ethical issues related to scientific investigation and the ethical implications of scientific discoveries for society. Emphasis on discussion of case studies about specific ethical issues in science, and readings by both scientists and non-scientists.

**HON 308V. Into the Final Frontier****3 Credits**

Exploration of space; a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives.

**HON 313. Research and Writing****3 Credits**

Workshop format designed to prepare students for research and writing associated with production of an honors thesis or a major research assignment. Does not count for general education or honors certification credit.

**HON 314. Successful Fellowship Writing****1 Credit**

Provides scholars with hands-on skills to complete proposals for scholarships and fellowships, such as the Truman, Rhodes, Marshall, Goldwater, Udall, and others. Other skills include how to write resumes, develop general research skills, and find grant and foundation sources.

**HON 318V. The World of Cinema****3 Credits**

Appreciation of the art of motion pictures as world-wide medium specific to national cultures. Refinement of cinematic literacy and critical viewing skills. Historical and thematic overview emphasizes collaborative nature of medium in various genres from 1895 to present. Selected films from different periods and different countries. Substantial library research projects.

**HON 321V. Agriculture in an Interconnected World****3 Credits**

Study of the impact of agriculture on cultural and social systems, with special emphasis on twentieth century urban development.

**HON 324V. Science and the Arts: Theatre and Story****3 Credits**

This course examines present day relations between the sciences and the representation and communication of science, especially in connection with theatre, narrative fiction, and autobiography. Crosslisted with: THTR329.

**HON 326V. Art and Mythology****3 Credits**

Mythological figures, past and present, in the visual arts. Through iconographical studies (attributes and symbols), trace the development of visual traditions that evolved from the literary sources of classical Mediterranean mythology.

**HON 328V. Rock History: 20th Century Popular Music****3 Credits**

Evolution of popular music in the 20th Century. Examines the history of popular music conventions, influences, and breakthroughs through the 20th Century. Topics include the originations of major music styles and their evolution as cultivated by key artists, scientific advancements, and sociopolitical change, contextualized within the contemporaneous history. Of particular concern are the influences of groundbreaking artists; the effect of evolving playback electronics, recording devices, and musical instruments; and the interplay between music and economic depression, war, civil rights, sexual revolution, and other sociopolitical events.

**HON 335V. Legal Issues in Modern Society****3 Credits**

Case study approach to contemporary legal problems involving environment, consumer protection, international law, corporate responsibility.

**HON 336. Latina Feminisms: Testimonios from the Borderlands****3 Credits**

This course is about the testimonies and autobiographical writings of and by Latinas in the United States. Life stories are told through many forms: "testimonios," memoirs, autobiographies and autobiographical fiction, oral histories and short stories, poetry and poetic prose pieces, essays, and audio-stories. Drawing from these sources of knowledge, we will explore feminist epistemologies and cast a critical eye on traditional knowledge claims and objectivity. The course focuses on Chicana/Latina feminist theories, the empirical educational research that draws upon these theories, and testimonios as method, epistemology, and pedagogy. Among the questions we will examine will be those concerning knowledge production, sexual politics, the mind-body-spirit connection, voice, representation, and truth.

**HON 340V. Indian Law and Policy****3 Credits**

Explores the principles, doctrines, and texts governing the legal relations between the United States and Indian tribes, the history of federal Indian law and policy, tribal property, treaty rights and sovereignty, congressional plenary power, the trust doctrine, jurisdiction in Indian country, and tribal government. Topic specifically examined in the course include tribal lawmaking powers, gaming and economic development in Indian country, protection of Indian religious rights and cultural property, water rights, fishing, hunting and other treaty-based rights.

**HON 341V. The Old Testament as Literature****3 Credits (3)**

Old Testament surveys a portion of the thirty-nine canonical books of the Old Testament from a literary approach, centered on the so-called historical-critical method that developed in the 19th C under such figures as Julius Wellhausen. Higher criticism of the texts, their sources, authorship, dating and interdependency has led to deepened insights as well as scholarly conflict. In addition, we will examine several apocryphal books that have continuing importance in our understanding of Old Testament. We will read the Old Testament along with an introduction and some supplementary materials.

**HON 347V. World Dance****3 Credits**

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as DANC 451V with differential assignments for Honors students.

**HON 348V. Comparative Mythology: Myth, Ritual, and the Life Cycle****3 Credits**

Exploration of the central myths of several religious traditions and investigation of how each, through ritual, has given meaning to key moments in the journey of the individual through life.

**HON 349V. Islam and the West: Cultural Contacts, Conflicts, and Exchanges****3 Credits**

This course examines interactions, encounters and cross-fertilization between the Islamic world and the West from the 7th -21st century. It begins with the origins of Islam and its relationship to Judaism and Christianity and ends in the post 9/11 present, an era some characterize as dominated by a "clash of civilizations."

**HON 351V. Interpersonal Relations and the Self****3 Credits**

Course explores the ways in which culture influences interpersonal relations and conceptions of the self. The course considers a variety of issues such as: interpersonal communications, self-awareness, self-disclosure, non-verbal behavior, intimacy, love, trust, jealousy, conflict management, self-management, culturally determined views of the self, self-presentation, and self-identity. Differences between the way the issues are viewed by different groups within our society, as well as between societies, will be considered.

**HON 353V. Justice without Prejudice****3 Credits**

Exploration of central questions about race, ethnicity, and justice. Students will learn to argue persuasively from different perspectives, both orally and in writing.

**HON 362V. Native American Philosophy and Spirituality****3 Credits**

Survey of philosophical traditions of Indigenous peoples of the Western Hemisphere. This course examines various forms of spiritual expression which encompasses art, dance, music, political/social activism, and the relationship to land. This course looks at present-day spiritual issues and on-going practices in Native America.

**HON 365V. African and Caribbean: Literature and Film****3 Credits**

Selected films and literary works shaped by colonial and post-colonial experiences in contemporary Africa and the Caribbean. Focus on the ongoing search for alternative identities in the form of a decolonized literature and culture.

**HON 366V. The Gothic Imagination****3 Credits**

Introduction to Gothic literature from its beginnings in the late eighteenth century that focuses on the political, psychological, religious, social, and familial values this literary genre explores and questions.

**HON 370V. Design: The Creative Act****3 Credits**

Explores the nature of design and what it means to design in various diverse media. Included are creative efforts in writing, art, music, and technology. Commonalities and differences are considered.

**HON 371V. Paris: Beyond the Eiffel Tower****3 Credits (3+3P)**

This interdisciplinary course focuses on the evolution of the city of Paris from its earliest beginnings in the fifth century to modern times. Through the use of historical, political, sociological and artistic texts and films, we will explore the various narratives which emerge from the built environment of Paris as well as its mythic status as the "City of Light and Romance" and "Capital of Revolution., Modernity and Art."

**HON 374V. The European City: History and Culture****3 Credits**

Historical overview of development, growth, and culture of European cities.

**HON 375V. The U.S. City: A History of Race, Space, and Urbanization****3 Credits**

This course takes the city as a starting point to understand larger social and political developments in the United States. Processes of segregation and exclusion have placed people of color in the United States on the periphery of social, cultural and geographical power in the nation. We will explore how Asian Americans, Latinas/os, and African Americans have navigated, created, and made sense of urban environments. Students will learn to interpret space for evidence of past and present social relationships, including how race intersects with gender, class, sexuality, and nation.

**HON 377V. Freedom of Speech and the Law****3 Credits**

Examination of freedom of speech and of press both in the United States and in other societies. Examines a wide range of laws, court rulings and regulatory schemes covering areas such as defamation, sedition, and regulation of broadcasting and advertising.

**HON 378V. Technology and Policy****3 Credits**

Study of the processes through which society sets goals for science and technology, of the allocation of resources needed to achieve these goals, and of the obligations and conflicts that develop as the goals are realized. International comparisons of public policies.

**HON 379V. Literature as Film****3 Credits**

Considers the various results of literary adaptations to the screen. Participants will read literary texts written or translated into English and watch films from various countries as illustrations of this process.

**HON 380V. Comparative Economic Systems****3 Credits**

A global comparison of economic institutions and problems.

**HON 381V. Economic Development of Latin America****3 Credits**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries' problems.

**Prerequisite(s):** 3.2 cumulative GPA.

**HON 384V. Ethical Decisions in Organizations****3 Credits**

Examines ethical decisions in business, non-profit, and governmental organizations from a managerial perspective. Topics include ethical principles, recognition and application of principle-based ethics, stakeholders in ethical decisions, and analysis of the consistency between organizational decisions and ethical principles.

**HON 385V. Consumers and the Law****3 Credits**

A study of the multidisciplinary synergism of law, societal concerns, business, and ethics of consumer issues and attendant liability and remedies for the domestic and international markets.

**HON 387V. Comparative Perspectives on Women****3 Credits**

The history, antecedents, and consequences of sex and gender systems around the world from the perspective of sociology, anthropology, and psychology.

**HON 388V. Leadership and Society****3 Credits**

Exploration of the multifaceted nature of leadership in modern society through readings and seminar discussion.

**HON 390V. Worlds of Buddhism****3 Credits**

This course is an introduction to Buddhism and its contribution to the formation of (East) Asian cultures. It provides students with Buddhist and (East) Asian "case studies" - i.e., examples of the ways in which Buddhism has influenced, and has been influenced by, the region's various cultural and social milieus over time. The course is designed to offer opportunities to critically reflect on Buddhism as a transformative philosophical, cultural and individual system. May be repeated up to 3 credits.

**HON 394V. Southwestern and Border Literature****3 Credits**

Introduction to the culturally diverse literature of the American Southwest and borderlands region. Class analyzes evolution of the Southwest concept and considers degree to which the existence of a borderlands culture is manifest in literature.

**Prerequisite:** honors eligibility.

**HON 400. Honors Thesis****3 Credits**

Independent-study research and writing project to be carried out under the supervision of a faculty member.

**Prerequisite:** consent of instructor.

**HON 410. Honors Internship****3-6 Credits**

Assignments in departments to be supervised by faculty in the area. A cumulative 3.5 GPA is required. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits. Consent of Instructor required.

**HON 411V. Great Theorems: The Art of Mathematics****3 Credits**

Same as MATH 411G.

**HON 420. Independent Studies****1-3 Credits**

Directed, individual studies and projects.

**Prerequisites:** consent of instructor and honors eligibility.

**HON 421. Special Topics****1-3 Credits**

Special course offerings, with specific titles listed in Schedule of Classes. May be repeated up to 6 credits. Consent of Instructor required. Crosslisted with: EDUC 317V.

**HON 422. Directed Research****3 Credits**

Individual research projects supervised by faculty advisers. Consent of instructor required.

**HON 425V. Magic and Witchcraft in Medieval and Renaissance****3 Credits**

Examines the history of popular and scientific beliefs about magic and witchcraft in medieval and early modern Europe. Topics include the origins of the occult sciences in the West, Arabic sources of medieval magic, the occult sciences in scholasticism, witchcraft and medieval theology, the witch hunts of the sixteenth and seventeenth centuries, and the decline of belief in magic and witchcraft in the seventeenth century. Of particular concern are the boundaries that defined and separated magic, science, and religion in western thought from late antiquity through the Scientific Revolution. Same as HIST 425 with differential assignments for HON 425 students. Crosslisted with: HIST 425.

**HON 450V. The Sundt Honors Seminar****3 Credits**

The Sundt Honors Seminar is a unique, experience-based, interdisciplinary seminar developed and taught by the holder of the Sundt Honors Professorship for the year. The subject of the course will vary according to the discipline of the Sundt Professor. The course may include a travel experience related to the seminar topic, hosting of outside specialists, or other unique activity. Open to students by application. Students selected for the course are named Sundt Scholars. **Prerequisite(s):** ENGL 111G or equivalent.

**HON 521. Special Topics****3 Credits**

Graduate level to be cross-listed with HON 421 Special Topics at the undergraduate level.

## HORT-HORTICULTURE (HORT)

**HORT 100G. Introductory Plant Science****4 Credits (3+2P)**

Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 100G.

**HORT 110. Athletic Field and Golf Course Management****1 Credit**

Survey of proper management of athletic fields, golf courses and other turfgrass stands. Career opportunities in athletic field and golf course management will be discussed. Course includes field trips to local and regional sports turf facilities.

**HORT 200. Special Topics****1-4 Credits**

Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

**HORT 205. Introduction to Horticulture****3 Credits**

Principles and practices of horticulture. Basic chemical, physical, and biological principles that govern plant growth in different environments. Economics of plant science as related to the field of horticulture. Online course entirely. Intended for non-majors.

**HORT 210. Ornamental Plants I****4 Credits (3+2P)**

Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.

**HORT 211. Ornamental Plants II****4 Credits (3+2P)**

Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.

**HORT 240. Floral Quality Evaluation and Design****2 Credits (1+2P)**

Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.

**HORT 241. Floriculture Field Practicum****1 Credit**

Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.

**Prerequisite(s):** HORT 240 or consent of instructor.

**HORT 250. Plant Propagation****3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 250.

**HORT 300. Special Topics****1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**HORT 302V. Forestry and Society****3 Credits**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.

**HORT 305. Principles of Genetics****3 Credits**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. Crosslisted with: AGRO 305, ANSC 305, BIOL 305 and GENE 305

**Prerequisite(s):** BIOL 111G, BIOL 211G and either CHEM 111G or CHEM 115.

**HORT 307. Landscape Design****3 Credits (1+4P)**

Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques. Prerequisites : HORT 210 or HORT 211 or concurrent enrollment or consent of instructor.

**HORT 310. Medicinal Herbs****3 Credits**

Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.

**HORT 315. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 315

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**HORT 365. Principles of Crop Production****4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Crosslisted with: AGRO 365

**Prerequisite(s):** AGRO/HORT 100, CHEM 111G or equivalent and MATH 120 or equivalent.

**HORT 377. Introduction to Turfgrass Management****4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease insects and turfgrass varieties. Crosslisted with: AGRO 377

**HORT 378. Turfgrass Science****4 Credits (3+3P)**

Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology.

**Prerequisite(s):** HORT 377 or consent of instructor.

**HORT 391. Internship****1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

**HORT 447. Seminar****1 Credit**

Review of current literature. Same as AGRO 447 and SOIL 447.

**HORT 449. Special Problems****1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**HORT 450. Special Topics****1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

**HORT 462. Plant Breeding****3 Credits**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

**Prerequisite(s):** ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

**HORT 465. Landscape Construction and Maintenance****4 Credits (3+2P)**

Application of landscape design and construction principles to build and maintain residential, small commercial and selected public managed landscapes.

**HORT 471. Plant Mineral Nutrition****3 Credits**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471.

**Prerequisite:** EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

**HORT 479. Advanced Turfgrass Science****3 Credits**

Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.

**Prerequisite:** HORT 378 or consent of instructor.

**HORT 485. Vegetable Crop Management****4 Credits (3+2P)**

Physiological, environmental and cultural aspects of vegetable crop production.

**Corequisite(s):** AGRO 365 or HORT 365, or consent of instructor.

**HORT 486. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: AGRO 485, SOIL 485, E S 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**HORT 488. Greenhouse Management****4 Credits (3+3P)**

Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.

**Prerequisite(s):** HORT/AGRO 365 or consent of instructor.

**HORT 492. Diagnosing Plant Disorders****3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.

**Prerequisites:** EPWS 303 and EPWS 310.

**HORT 500. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**HORT 505. Research Orientation****4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505 and SOIL 505

**HORT 506. Plant Genetics****3 Credits**

Advanced treatment of the principles of classical genetics and heredity with emphasis on the nature and action of the gene including molecular analysis. May be repeated up to 3 credits. Crosslisted with: AGRO 506. CHEM 345 recommended.

**Prerequisite(s):** AGRO/GENE/HORT/BIOL/ANSC 305 or consent of instructor.

**HORT 514. Soil-Plant Relationships****3 Credits**

Physical, chemical, and biological soil environment as it affects plant and crop growth. Same as AGRO/SOIL 514.

**Prerequisites:** BIOL 314, SOIL 252.

**HORT 515. Crop Physiology****3 Credits**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 515

**Prerequisite(s):** EPWS/BIOL 314 or consent of instructor.

**HORT 525. Scientific Writing How to be a Productive and Effective Writer 1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

**HORT 533. Environmental Physiology of Plants****3 Credits**

Integral responses of plants and crop productivity to naturally occurring and modified environmental factors such as radiation, temperatures, water vapor, carbon dioxide, and air flow. Same as AGRO/BIOL 533.

**Prerequisite:** BIOL 314 or consent of instructor.

**HORT 590. Graduate Seminar****1 Credit**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

**HORT 595. Internship****1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

**HORT 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, E S 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

**Prerequisite(s):** Master level graduate students.

**HORT 597. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination.

The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and SOIL 597

**HORT 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**Prerequisite:** consent of instructor.

**HORT 599. Master's Thesis****15 Credits**

Thesis.

**HORT 609. Breeding for Plant Disease Resistance****3 Credits**

A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. Same as AGRO 609.

**HORT 610. Advanced Crop Breeding****4 Credits (3+3P)**

Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. Same as AGRO 610.

**Prerequisite:** AGRO 462 or consent of instructor.

**HORT 620. Instrumentation in Agronomy****3 Credits**

Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. Same as AGRO/SOIL 620.

**HORT 625. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students in the 625 course will be required to perform additional research than those students in the 525 cross-listing. Crosslisted with: AGRO 525, EPWS 525, HORT 525 and SOIL 525.

**HORT 696. Doctors Proposal****1 Credit**

Current research proposal written by PhD level graduate students. Consent of Instructor required. Crosslisted with: AGRO 696, E S 696 and SOIL 696. Restricted to: Doctors PLEN majors.

**Prerequisite(s):** PhD level graduate students.

**HORT 697. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 697 and SOIL 697

## HOST-HOSPITALITY AND TOURISM (HOST)

**HOST 155. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

**HOST 201. Introduction to Hospitality Industry****3 Credits**

Overview of hospitality industry; organization and operation of lodging, food and beverage, and travel and tourism segments; focus on career opportunities and future trends of hospitality industry. Restricted to: Community College campuses only.

**HOST 202. Front Office Operations****3 Credits**

Hotel/motel front office procedures detailing flow of business, beginning with reservations and extending to the night audit process. Restricted to: Community College campuses only.

**HOST 203. Hospitality Operations Cost Control****3 Credits**

Management of Food & Beverage facilities using cost control techniques. Functional training in menu analysis and development with all phases of product flow through a Food & Beverage organization explored. Restricted to: Community Colleges only.

**HOST 204. Promotion of Hospitality Services****3 Credits**

Organization of hotel marketing functions; developing a marketing plan to sell the varied services of the hotel/motel property. Restricted to: Community College campuses only.

**HOST 205. Housekeeping, Maintenance, and Security****3 Credits**

Function of housekeeping departments, including personnel, sanitation, maintenance, and materials. A survey of security procedures to include guest protection and internal security of hotel/motel assets. Restricted to: Community College campuses only.

**HOST 206. Travel and Tourism Operations****3 Credits**

Transportation, wholesale and retail operations, attractions, the traveler, tourism development, and operational characteristics of tourism business. Restricted to: Community College campuses only.

**HOST 207. Customer Service for the Hospitality Industry****3 Credits**

Concepts of service and the customer, integrating the need for service quality, and the continuing efforts to maximize returns for the operation. Classic service styles as well as more modern service techniques are covered. Students gain in-depth managerial knowledge, planning skills, and hands-on techniques for consistently delivering quality and service in a variety of operations. Restricted to: Community College campuses only.

**HOST 208. Hospitality Supervision****3 Credits**

Strategies for directing, leading, managing change and resolving conflict. Prepares students to meet expectations of management, guests, employees, and governmental agencies. Restricted to: Community College campuses only.

**HOST 209. Managerial Accounting for Hospitality****3 Credits**

Prepares students to make effective business decisions based on financial report information; forecasting, budgeting, cost analysis. Restricted to: Community College campuses only.

**Prerequisite(s):** BOT 120 or ACCT 252.

**HOST 210. Catering and Banquet Operations****3 Credits**

Teaches the basics of catering and banquet operations, including computer coordination, planning, set up, service, and completion. Restricted to Community Colleges campuses only.

**HOST 214. Purchasing and Kitchen Management****3 Credits**

Technical purchasing concepts, product selection, and specifications. Safety and sanitation as they relate to food service establishments. Prepares student for work with HACCP programs. Restricted to Community Colleges campuses only.

**HOST 216. Event, Conference and Convention Operations****3 Credits**

The ability to successfully plan, organize, arrange, and execute special events is critical to the success of many hospitality organizations. This course gives the student a grounding in the skills necessary to achieve success in this area. A variety of events are discussed and the similarities and differences with conferences and conventions are explored. Students are taught to organize and plan events of varying type and durations. Sales, logistics, and organizing skills are emphasized. Restricted to: Community College campuses only.

**HOST 219. Safety, Security and Sanitation in Hospitality Operations****3 Credits**

It is the responsibility of the manager to provide appropriate security, sanitation, and safety precautions in hospitality operations. Preparation for internal and external disasters is an important task for the Hospitality Manager. This course uses the National Restaurant Association ServSafe® training material. Restricted to: Community College campuses only.

**HOST 220. Experiential Travel****1-3 Credits (1-3)**

Course provides an opportunity for students to plan, prepare for and experience travel to destinations they might not otherwise have visited. Students experience local culture and peoples. May be repeated up to 9 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HOST 201 or consent of instructor.

**HOST 221. Internship I****1-3 Credits (1-3)**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEHS, HOST majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**HOST 222. Cooperative Experience II****3 Credits**

Continuation of HOST 221. Restricted to majors. Graded: S/U. Restricted to: Community College campuses only. Restricted to HOST majors.

**Prerequisite(s):** HOST 221.

**HOST 223. Travel Agency Principles****3 Credits**

Travel agents are called upon to exhibit broad knowledge about many different tourism products. This course prepares students to undertake the challenging job of an agent in a travel agency. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**HOST 224. Travel Agency Booking & Operations****3 Credits**

Course trains students to use the common electronic booking software that is found in travel agencies. Familiarization with operational procedures of travel agencies. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HOST 223.

**HOST 230. Wedding Events Management****3 Credits**

This course will address various issues that could potentially arise in the preparation and management of a wedding or related event. All aspects of planning and attention to details that will ensure that students are prepared to provide services as a professional wedding planner. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**HOST 239. Introduction to Hotel Management****3 Credits**

This course covers basic management functions in hotels, resorts, Boutique Hotels, Bed & Breakfast establishments, and other lodging operations. All aspects of the operation are covered including guest management, operations, and sales and marketing. Restricted to: Branch campuses only.

**HOST 255. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits. Restricted to Community Colleges campuses only.

**HOST 298. Independent Study****1-3 Credits (1-3)**

Individual studies directed by consenting faculty with prior approval of department chair. May be repeated for a maximum of 3 credits. Restricted to: Community College campuses only.

**Prerequisite(s):** Minimum 3.0 GPA and sophomore standing.

## **HRTM-HOTEL/RESTRNT/TOURISM MGT (HRTM)**

**HRTM 111. Freshman Orientation****1 Credit**

Orientation to university life, including available resources and methods to promote success at NMSU. Open to all freshmen and transfer students. Graded S/U.

**HRTM 200. Special Topics****1-4 Credits**

Specific subjects and credits to be assigned on a semester basis for both lecture and laboratory assignments. May be repeated for a maximum of 4 credits.

**Prerequisite:** consent of instructor.

**HRTM 201. Introduction to Tourism****3 Credits**

Survey of travel and tourism development and operating characteristics.

**HRTM 221. Introduction to Hospitality Management****3 Credits**

Overview of the major segments of the hospitality industry, with a focus on basic management principles.

**HRTM 231. Safety, Sanitation and Health in the Hospitality Industry****2 Credits**

Addresses public health, HACCP, safety and culinary nutrition responsibilities in the hospitality industry. Sanitation certification test allows students to receive national credential.

**HRTM 263. Food Production and Service Fundamentals****3 Credits (1+4P)**

Basic overview of food service systems including menu management, purchasing and production. The course includes basic principles of food fabrication and production. Topics include knife skills, culinary terminology, product identification, quality standards, nutritional cooking theory and application of food preparation techniques. The course includes laboratory aspects and demonstration of basic food production techniques, service styles, practices and procedures in food service operations including culinary math. This course provides students with an understanding of food service sanitation and culinary nutrition. Completion of a national certification examination is required. Restricted to Las Cruces campus only.

**Prerequisite(s):** HRTM 221 or FSTE 263G.

**HRTM 301. Hotel, Restaurant, and Tourism Marketing****3 Credits**

The development of effective marketing programs for hospitality service organizations. Prerequisites: HRTM 221

**HRTM 302. Hospitality Management Accounting****3 Credits**

Specialized accounting for hotel revenue and expenses; accounting for inventory, property, and equipment; hospitality payroll accounting; hotel departmental financial statements; income statement, balance sheet, and statement of cash flows; the analysis of financial statements; interim and annual reports; budgeting expenses; forecasting sales; budgetary reporting and analysis; and financial decision making.

**Prerequisite:** ACCT 221.

**HRTM 304. Hospitality and Travel Law****3 Credits**

Specialized applications of the law to the hospitality and tourism industry.

**Prerequisite:** HRTM 221.

**HRTM 307. Professional Development****1 Credit**

Covers essential elements of career management including preparation for a successful internship. Restricted to majors. Graded S/U.

**HRTM 311. Hospitality Leadership Management****3 Credits**

Examines modern leadership theory in the context of the hospitality industry. Connects contemporary leadership topics to their historical antecedents through focused reading, discussion and film.

**Prerequisites:** HRTM 221 and HRTM 201.

**HRTM 331. Hotel Operations I****3 Credits**

Analysis of hotel systems design, process, and applications for operating areas including guest services, reservations, reception, telecommunications, guest/city ledger, and the night audit.

**Prerequisites:** HRTM 201 and HRTM 221.

**HRTM 363. Quantity Food Production and Service****6 Credits (1+10P)**

Covers quantity food production including cooking concepts, sanitation and safety, teamwork, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe or NM Food Handler certification required. May be repeated up to 6 credits. Crosslisted with: HNDS 363.

**Prerequisite(s):** HRTM 263.

**HRTM 404. Gaming Operations and Organization****3 Credits**

Introduction to the multi-billion-dollar industry, including an historical overview, social and economic impacts of gaming, and casino operations.

**Prerequisites:** HRTM 201 and HRTM 221.

**HRTM 408. Hospitality Internship****1 Credit**

Hospitality and tourism professional work experience for HRTM majors only. Restricted to majors.

**Prerequisites:** HRTM 307 and consent of instructor.

**HRTM 409. HRTM Internship Seminar****1 Credit**

A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they encountered during HRTM 408 (Internship) and analyze them. Restricted to majors.

**Prerequisites:** HRTM 408.

**HRTM 410. Hospitality Cost Control****3 Credits**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers.) Provides tools needed to communicate effectively about global financial issues affecting the hospitality business.

**Prerequisite:** HRTM 408.

**HRTM 412. Beverage Management****3 Credits**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation.

**Prerequisite:** HRTM 408.

**HRTM 413. Restaurant Operations Management****4 Credits (1+6P)**

Provides a detailed understanding of the processes of restaurant operations management. Students are expected to increase kitchen technical skills, learn to cook from recipes and develop a personal culinary style. Provides the opportunity to perform a detailed analysis of a food and beverage operation, including running and selectively analyzing the reports from systems. Proof of current NM Alcohol Server certification required. May be repeated up to 4 credits.

**Prerequisite(s):** HRTM 363.

**HRTM 414. International Food and Wine****3 Credits**

An experiential examination of wine through lectures, films, guest speakers and focused tasting of food and wine. Topics include viticulture, wine making varietals, terroir, and food pairings. Student must be at least 21 years old.

**Prerequisite:** consent of instructor.

**HRTM 420. Club Management and Marketing****3 Credits**

Provides an understanding of the general operational and administrative procedures practiced in private clubs from a marketing perspective with a special emphasis on managing and marketing club food and beverage operations and service. It will provide the professional golf management and hospitality students with the unique sensitivities required in managing and operating in the increasingly lucrative club management market.

**HRTM 430. Hospitality Facilities Management****3 Credits**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant.

**Prerequisite(s):** HRTM 331, HRTM 408.

**HRTM 431. Hotel Operations II****3 Credits**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems.

**Prerequisite(s):** HRTM 331, HRTM 408.

**HRTM 432. Hotel Revenue and Sales Management****3 Credits**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level.

**Prerequisite:** HRTM 408.

**HRTM 433. Training for Hospitality Operations****3 Credits**

Analysis of training needs and methods in hospitality organizations.

**Prerequisite(s):** MGT 332.

**HRTM 434. Senior Capstone Experience****3 Credits**

Synthesizes all previous work. Students apply multi-disciplinary principles to the analysis of hospitality business cases and tourism problems.

**Prerequisite:** HRTM 408.

**HRTM 435. Resort Management****3 Credits**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities. Crosslisted with: HRTM 535.

**Prerequisite(s):** HRTM 331 or consent of instructor.

**HRTM 443. Meetings, Conventions and Special Events****3 Credits**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** HRTM 408.

**HRTM 450. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**Prerequisite:** consent of instructor.

**HRTM 492. Special Problems****1-4 Credits**

Individual research in a selected subject area of hospitality management. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

**Prerequisite:** consent of instructor.

**HRTM 510. Hospitality Cost Control****3 Credits**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers). Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. Same as HRTM 410 with additional work for graduate credit. Consent of Instructor required.

**HRTM 512. Beverage Management****3 Credits**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. Same as HRTM 412 with additional work for graduate credit. Consent of Instructor required.

**HRTM 530. Facilities Management****3 Credits**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant. Same as HRTM 430 with additional work for graduate credit. Consent of Instructor required.

**HRTM 531. Hotel Operations II****3 Credits**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. Same as HRTM 431 with additional work for graduate credit. Consent of Instructor required.

**HRTM 532. Hotel Revenue and Sales Management****3 Credits**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. Same as HRTM 432 with additional work for graduate credit. Consent of Instructor required.

**HRTM 535. Resort Management****3 Credits**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities. Crosslisted with: HRTM 435.

**Prerequisite(s):** HRTM 331 or consent of instructor.

**HRTM 543. Meetings, Conventions and Special Events****3 Credits**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. Same as HRTM 443 with additional work for graduate credit. Consent of Instructor required.

**HRTM 590. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

**Prerequisite:** consent of instructor.

**HRTM 598. Special Research Programs****1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

**Prerequisite:** consent of instructor.

**HRTM 599. Master's Thesis****1-6 Credits (1-6)**

Thesis.

**Prerequisite:** consent of instructor.

## HVAC-HEATING/AC/REFRIGERATION (HVAC)

**HVAC 100. EPA Clean Air Act: Section 608****1 Credit**

Refrigerant certification preparation to include basics of refrigerant bearing equipment, ozone depletion and the new legislation, technician categories covered and the certification examination.

**HVAC 101. Fundamentals of Refrigeration****4 Credits (3+2P)**

Refrigeration cycle and the various mechanical components. Use of special tools, equipment, and safety precautions.

**HVAC 102. Fundamentals of Electricity****4 Credits (3+2P)**

Introduction to electricity theory, Ohm's Law, circuits, AC/DC, and practical applications.

**HVAC 103. Electrical and Mechanical Controls I****4 Credits (3+2P)**

Applications of basic electrical and mechanical controls. Reading and drawing diagrams of simple refrigerating equipment. Safe use of testing equipment.

**Prerequisites:** HVAC 101 and HVAC 102, or consent of instructor.

**HVAC 110. Professional Development and Leadership****1 Credit**

As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: HVAC majors. S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

**HVAC 113. Job Shadowing****1 Credit**

Course will expose students to actual HVAC/R field work and provide them knowledge of the expectations of field work as they shadow an HVAC/R technician. Consent of instructor required. Restricted to: Community colleges only.

**HVAC 205. Commercial Refrigeration Systems****4 Credits (3+2P)**

Service and maintenance of commercial refrigeration equipment to include evacuation and charging procedures, electrical diagrams, and compressors and accessories.

**Prerequisites:** HVAC 103 or consent of instructor.

**HVAC 207. Residential Air Conditioning Systems****4 Credits (3+2P)**

Applications and types of equipment used in comfort cooling. Preventive maintenance, service, and repairs common to evaporative coolers and refrigerated air conditioning systems. Air properties and psychometrics.

**Prerequisite:** HVAC 103 or consent of instructor.

**HVAC 209. Residential Heating Systems****4 Credits (3+2P)**

Gas and electric systems used in comfort heating. Maintenance procedures, safety, troubleshooting, and servicing malfunctions in equipment.

**Prerequisite:** HVAC 103 or consent of instructor.

**HVAC 210. Commercial Air Conditioning and Heating Systems****4 Credits (3+3P)**

Covers troubleshooting mechanical and electrical problems associated with HVAC equipment in commercial buildings. Includes gas, electric, and heat pump systems. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HVAC 103 or consent of instructor.

**HVAC 211. Heat Pump Systems****4 Credits (3+2P)**

Reverse cycle refrigeration systems utilized in comfort heating and cooling. Troubleshooting mechanical electrical problems associated with heat pumps. HVAC 103 or consent of instructor.

**HVAC 213. Practicum****3 Credits**

Working in the field with journeymen service technicians. Develop and apply job skills. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HVAC majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** HVAC 113 and Consent of instructor.

**HVAC 220. Introduction to Sheet Metal Fabrication****4 Credits (3+2P)**

Introduction to sheet metal fabrication to include hands-on practical laboratory applications, cutting and forming procedures, identifying types and gauges. Design and layout techniques.

**Prerequisite:** OETS 118 or equivalent math or consent of instructor.

**HVAC 225. New Mexico Mechanical Codes: HVAC****1-4 Credits**

Principles and regulations developed for HVAC, sheet metal, and plumbing occupations to include terminology, ventilation air supply, exhaust systems, duct systems, combustion air, chimneys and vents, boilers/water heaters, refrigeration, panel and hydronic panel heating, fuel gas piping, storage systems, solar systems, and workmanship standards. May be repeated for a maximum of 12 credits.

**HVAC 255. Special Topics****1-6 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**HVAC 290. Special Problems****1-4 Credits**

Individual studies related to heating, air conditioning, and refrigeration.

**Prerequisites:** HVAC 101, HVAC 102, and consent of instructor.

## I B-INTERNATIONAL BUSINESS (I B)

**I B 317. International Marketing****3 Credits**

Same as MKTG 317.

**I B 351. International Business****3 Credits**

The various aspects of international business, and identification and analysis of problems encountered by multinational companies.

**Prerequisite:** junior standing or consent of instructor.

**I B 398. International Business and Economic Environments****3 Credits**

Description and analysis of various world regions, e.g., Pacific Rim, Eastern Europe, South Asia. Region will vary from semester to semester.

**I B 449. Open Economy Macroeconomics****3 Credits**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: ECON 449.

**Prerequisite(s):** FIN 341 OR ECON 311.

**I B 450. International Economics****3 Credits**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: ECON 450G

**Prerequisite(s):** ECON 251G and ECON 252G.

**I B 458. Comparative International Management****3 Credits**

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as Mgt. 458.

**I B 475. International Finance****3 Credits**

Same as FIN 475. Crosslisted with: FIN 475 and FIN 575.

**Prerequisite(s):** FIN 341.

**I B 489. Senior Seminar in International Business****3 Credits**

Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project.

**Prerequisite:** I B core.

## I E-INDUSTRIAL ENGINEERING (I E)

**I E 110. Industrial Engineering Orientation****1 Credit**

Introduction to Industrial Engineering Department, Facility Research and Resources. Overview of where industrial engineering fits into larger view of all of engineering. Introduction to university resources for industrial engineering students. Restricted to majors.

**I E 151. Computational Methods in Industrial Engineering****3 Credits**

History, social implications, and application of computers and an introduction to computer programming, word processing, and database management systems. Satisfies General Education computer science requirement.

**Prerequisite:** MATH 121G.

**I E 152. Introduction to Industrial Engineering****2 Credits**

Historical development of industrial engineering, present practice and trends.

**Prerequisite:** MATH 120.

**I E 200. Special Problems-Sophomore****1-3 Credits**

Directed individual projects. May be repeated for a total of 3 credits.

**Prerequisite:** consent of faculty member.

**I E 217. Manufacturing Processes****2 Credits**

Manufacturing methods and industrial processes which include casting, forming and machining. May be repeated up to 2 credits. Crosslisted with: E T 217. M E 159.

**Prerequisite(s):** MATH 121G.

**Corequisite(s):** I E 217 L.

**I E 217 L. Manufacturing Processes Laboratory****1 Credit**

Laboratory associated with I E 217. May be repeated up to 1 credits.

**Prerequisite(s):** M E 159.

**I E 300. Special Problems-Junior****1-3 Credits**

Directed individual projects. May be repeated for a total of 3 credits.

**Prerequisite:** consent of faculty member.

**I E 311. Engineering Data Analysis****3 Credits**

Methodology and techniques associated with identifying and analyzing industrial data. May be repeated up to 3 credits. C- or better in I E 151, C S 110, or equivalent.

**Prerequisite(s):** C- or better in MATH 192G.

**I E 316. Methods Engineering****3 Credits (2+3P)**

Methods analysis and design. Work measurement techniques. Job evaluation and wage incentive methods. May be repeated up to 3 credits.

**Prerequisite(s):** I E 311, M E 159.

**I E 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Crosslisted with: C E 330, CH E 330, E E 330, E S 330, E T 330, M E 330 and WERC 330

**I E 351. Applied Problem Solving in Industrial Engineering****3 Credits**

Application of computational techniques to engineering problems including the use of commercial programs in statistics and applied mathematics. Restricted to majors.

**Corequisite:** I E 311.

**I E 365. Quality Control****3 Credits**

Statistical analysis of quality in manufacturing. Acceptance sampling and control charts.

**Prerequisite:** I E 311 or equivalent.

**I E 375. Manufacturing Processes II****3 Credits**

Review of basic manufacturing processes. Advanced topics in casting, forming, machining and joining; major process parameters; economics of processes.

**Prerequisite:** I E 217 or E T 217.

**I E 381. Technology Ventures****3 Credits**

This course looks at how new technology ventures are formed at the individual entrepreneur and corporate levels. It covers the development of science and engineering based ventures from ideas through creating customer value. This is the first course in the Entrepreneurship Minor. The roles of science and engineering specialists in the creation of customer value are defined in preparation for development of technology-based enterprises.

**I E 382. Business for the Practicing Engineer****3 Credits**

Business tools and skills, including technology commercialization, patent applications, preparing a technology-oriented business plan, reading and constructing financial documents, modeling and understanding markets, e-commerce, QFD, concurrent engineering, engineer's role in the global economy, and engineer's impact on product design and cost.

**Prerequisite:** engineering major, junior level or above.

**I E 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of faculty member.

**I E 411. Occupational Safety****3 Credits**

Practical methods to improve safety in the workplace. Topics include OSHA and other regulations, hazard recognition, assessment and control, industry standards, risk assessment and safety management. Material is applicable to a variety of workplace settings. This course is intended for College of Engineering students who have completed their lower-division requirements in mathematics, engineering, technology, and basic science. Same as I E 561 with differential assignments. **Prerequisite:** Junior standing

**I E 413. Engineering Operations Research I****3 Credits**

Deterministic operations research modeling including linear and integer programming. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 192G.

**Corequisite(s):** MATH 480.

**I E 423. Engineering Operations Research II****3 Credits**

Probabilistic operations research modeling, including queuing systems and their optimization; Markov chains. May be repeated up to 3 credits.

**Prerequisite(s):** I E 311.

**Corequisite(s):** MATH 392.

**I E 424. Manufacturing Systems****3 Credits**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling, and inventory control.

**Prerequisite:** I E 311.

**I E 451. Engineering Economy****3 Credits**

Discounted cash flows, economics of project, contract and specifications as related to engineering design.

**I E 453. Leadership and Motivation****3 Credits**

Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Same as MGT 453.

**Prerequisite:** MGT 309 or consent of instructor.

**I E 460. Evaluation of Engineering Data****3 Credits**

Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods.

**Prerequisite:** I E 311 or equivalent.

**I E 466. Reliability****3 Credits**

Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data.

**Prerequisite:** I E 311 or equivalent.

**I E 467. Discrete-Event Simulation Modeling****4 Credits**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments. Same as I E 567.

**Prerequisite:** I E 311 or equivalent.

**I E 478. Facilities Planning and Design****3 Credits**

Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies. Pre/

**Prerequisite:** I E 316.

**Corequisite:** I E 424.

**I E 480. Senior Design****3 Credits (2+3P)**

Multi-disciplinary team design project for external clients. Involves semester long activities including major design report and presentation.

**Prerequisites:** senior standing, I E 467.

**I E 490. Selected Topics****1-3 Credits**

May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of the head of the department.

**I E 505. Directed Readings****1-3 Credits**

May be repeated for a maximum total of 6 credits.

**Prerequisite:** consent of the head of the department.

**I E 515. Stochastic Processes Modeling****3 Credits**

Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting.

**Prerequisites:** I E 311 or equivalent; and MATH 392 or equivalent.

**I E 522. Queuing Systems****3 Credits**

Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications.

**Prerequisite:** I E 311 or equivalent.

**I E 523. Advanced Engineering Economy****3 Credits**

Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523.

**I E 524. Advanced Production and Inventory Control****3 Credits**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments.

**I E 525. Systems Synthesis and Design****3 Credits**

Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities.

**I E 530. Environmental Management Seminar****1 Credit**

Same as C E 530, E E 530, CH E 530.

**I E 531. Fundamentals of Operations Research Techniques****3 Credits**

Key concepts, terminology, paradigms, and methods of operations research: Linear programming including assignment and transportation algorithms; stochastic analysis, including inventory control and queuing systems; general approaches, including goal, integer, nonlinear and dynamic programming.

**I E 533. Linear Programming****3 Credits**

Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis.

**I E 534. Nonlinear Programming****3 Credits**

Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods. Prerequisite: MATH 192G or equivalent

**I E 535. Discrete Optimization****3 Credits**

Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms.

**I E 537. Large Scale Systems Engineering****3 Credits**

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making.

**I E 539. Fundamentals of Transportation and Routing in Logistics****3 Credits**

Introduction to the conceptual, methodological, and mathematical foundations of transportation and routing problems in logistics system. Emphasis on mathematical modeling and computational algorithms.

**I E 545. Characterizing Time-Dependent Engineering Data****3 Credits**

Theory and techniques employed in the characterization of stochastic processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed.

**Prerequisite:** I E 311 or equivalent.

**I E 561. Advanced Safety Engineering****3 Credits**

Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis.

**Prerequisite:** graduate status in engineering.

**I E 563. Topics in Engineering Administration****3 Credits**

Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.

**I E 567. Design and Implementation of Discrete-Event Simulation****3 Credits**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.

**I E 571. Advanced Quality Control****3 Credits**

Advanced topics in quality control and design of experiments for improvement of quality.

**Prerequisite:** I E 311 or equivalent.

**I E 575. Advanced Manufacturing Processes****3 Credits**

Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions.

**Prerequisite:** graduate standing.

**I E 590. Selected Topics****1-3 Credits**

May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of the head of the department.

**I E 598. Special Research Programs****1-3 Credits**

Individual analytical or experimental investigations. May be repeated for a maximum total of 6 credits.

**Prerequisite:** consent of instructor.

**I E 599. Master's Thesis****15 Credits**

Thesis.

**I E 610. Topics in Operations Research****3 Credits**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

**I E 620. Topics in Computer Modeling****3 Credits**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

**I E 630. Topics in Engineering Management****3 Credits**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

**I E 690. Selected Topics****1-15 Credits**

May be repeated.

**Prerequisite:** consent of department head.

**I E 700. Doctoral Dissertation****15 Credits**

Dissertation.

## ICT-INFO & COMMUNICATION TECH (ICT)

**ICT 320. Introduction to Internet Protocols****3 Credits**

Present a overview of Internet Protocols Applications. May be repeated up to 3 credits.

**ICT 339. Introduction to Digital Forensics and Incident Response****3 Credits**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.

**Prerequisite(s):** ICT 360.

**ICT 352. Software Programming for Information and Communication Technology****3 Credits**

Computer programming techniques for information and communication technology topics.

**ICT 360. Operating Systems for ICT****3 Credits**

Command Line interface, File systems, File manipulations, remote login. For information and communication technologists.

**ICT 362. Software Technology II****3 Credits**

A continuation of topics from ICT 352 that are directed toward more advanced software development. Topics include problem analysis, object oriented, structured logic, and development concepts using JAVA.

**Prerequisite(s):** ICT 352.

**ICT 364. Windows Server Administration****3 Credits**

Configuration and maintenance of programs in Windows Server and Server Installation, Active Directory, Storage, Server Maintenance, Troubleshooting Methodology, SQL Server, Web Server, Authentication Procedures, Mail Servers. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** ICT 339. **Prerequisite(s):** ICT 362.

**ICT 377. Computer Networking I****3 Credits**

Topics presented from the point of view of the network administrator include computer network design and applications from LAN to WAN to the Internet, office LANs, cable certification, switches, routers, Windows server, TCP/IP networks, network protocols, network diagnostics, campus network and Internet routing, the OSI layers from physical to transport.

**Prerequisite(s):** junior standing.

**ICT 435. Senior Project****3 Credits**

Advanced ICT Project. Normally taken during last semester of the program. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** ICT 458 and ICT 460. **Prerequisite(s):**

ICT 377. **Restricted to:** ICT majors.

**ICT 450. Ethical Hacking****3 Credits**

Ethical Hacking and Penetration testing techniques. May be repeated up to 3 credits.

**Prerequisite(s):** ICT 339.

**ICT 457. Introduction to Information Security Technology****3 Credits**

This course provides an overview of security challenges and strategies of countermeasure in the information systems environment. Topics include definition of terms, concepts, elements, and goals incorporating industry standards and practices with a focus on availability, vulnerability, integrity and confidentiality aspects of information systems. May be repeated up to 3 credits.

**ICT 458. Database Design and Applications****3 Credits**

MySQL and PHP. Data conversion using PHP, mysql and Python. Methods of transferring data from electronic boards and data feeds, into databases. Use of SQL in java programming. Remote programming of computers for running database systems in a mixed OS environment. Generation of web pages directly from Database queries. May be repeated up to 3 credits.

**Prerequisite(s):** ICT 362.

**ICT 460. Web Technologies and Multimedia****3 Credits**

Addresses the latest multimedia technology advances and how they apply to the information and communication technology fields. May be repeated up to 3 credits.

**Prerequisite(s):** ICT 360.

**ICT 462. Remote Access Operating Systems with Linux****3 Credits**

Operating systems applications and interfacing with an introduction to systems administration. C Programming, System Backups, Setup and Maintenance Linux Servers. Webserver with virtual domains, CGI programming and interface with MySQL databases. May be repeated up to 3 credits.

**ICT 463. Computer Systems Administration****3 Credits**

Advance topics in computer systems administration from ICT 462. Use of Python to solve numerous engineering problems including video and audio. Image manipulation. Using PostScript for image and typesetting development. Integration of C programming with Python. May be repeated up to 3 credits.

**Prerequisite(s):** ICT 362 and ICT 462.

**ICT 477. Computer Networking II****3 Credits**

Advanced concepts in computer network design and applications including managing the campus networks, virtual LANs (VLAN), network security, wireless networks, and LAN to WAN to internet.

**Prerequisite(s):** ICT 377 or ET 377.

## **INMT - INDUSTRIAL MAINTENANCE (INMT)**

**INMT 133. Process Technology and Systems****4 Credits**

Provides instruction in the use of common process equipment. Students will use appropriate terminology and identify process equipment components such as piping and tubing, valves, pumps, compressors, turbines, motors, engines, heat exchangers, heaters, furnaces, boilers, filters dryers and other miscellaneous vessels. Included are the basic functions, scientific principles and symbols. Students will identify components on typical Process Flow Diagrams and Process and Instrument Diagrams. Restricted to Carlsbad campus only.

**INMT 134. Maintenance Principles****4 Credits**

The course is an introduction to the maintenance of equipment utilizing mechanical, electrical and instrumentation concepts. Topics include: hand tools, bearing fundamentals, equipment lubrication, material handling, electrical safety, battery systems, diagrams, electrical production and distribution, transformers, breakers, switches, AC and DC motors, motor controllers and operations, and introduction to automation and instrumentation control. Restricted to Carlsbad campus only.

**INMT 165. Equipment Processes****4 Credits**

This course introduces power transmission equipment and machinery components, including belt/chain driven equipment, speed reducers, variable speed drives, couplings, clutches, and conveying equipment. Students will learn the operation, maintenance, and troubleshooting for these types of equipment. The course also includes Overhead Crane Certification and Safety. Restricted to Carlsbad campus only.

**INMT 205. Programmable Logic Controllers and Applications****4 Credits**

Students learn about programmable logic controllers; architecture; programming, interfacing, and applications. Hands-on experience on modern commercial PLC units is the main component. Restricted to Carlsbad campus only.

**Prerequisite(s):** Computer Literacy (CS 110).

**INMT 223. Electrical Repairs****4 Credits**

This course outlines for students the types of problems that occur in electrical machinery and systems. The course covers trouble-shooting and diagnosis, preventative maintenance, and how to make necessary repairs. Restricted to Carlsbad campus only.

**INMT 235. Mechanical Drives I****4 Credits**

This course teaches the fundamentals of mechanical transmission systems used in industrial, agricultural, and mobile applications. Students will learn industrial relevant skills including how to: operate, install and analyze performance, and design basic transmission systems using chains, feed-belts, spur gears, bearings, and couplings. Vibration analysis will be used to determine when to perform maintenance of power transmission components. The course also covers power transmission safety, and introduction to belt and chain drives (applications, installations, and tensioning), and introduction to gear drives, coupling, and bearing, basic troubleshooting, blueprint and print reading, learning the basics of electrical drives and PDM and PM. Restricted to Carlsbad campus only.

**INMT 236. Lubrication Process****3 Credits**

This course teaches the technical skills needed to operate, install, tune, maintain and troubleshoot automatic lubrication systems. Lubrication concepts, setup and tuning, pneumatic pumps, series-progressive valve systems and microprocessor based lubrication controllers will be covered. The course covers the principles of and importance of lubrication, oils and grease types and applications, lube management (storage, handling, and purity), and PDM and PM. Restricted to Carlsbad campus only.

**INMT 237. Hydraulics I****2 Credits**

This course teaches fundamentals of hydraulic systems used in industry mobile application. Students learn the basic theory of application of hydraulic and electricity as it applies to hydraulics. Covered in the course are basic systems, principles of flow, pressure, viscosity, filtration, and colling. Also covered are basic components such as motor, pumps, cylinders, piping and control and relief valves. Troubleshooting strategies are discussed, along with blueprint and print reading, and PDM and PM. Industry, relevant skills including how to operate, install, analyze performance, and design basic hydraulic systems, reviewing intermediate hydraulic components and system applications. Restricted to Carlsbad campus only.

**INMT 261. Pump Operations I****4 Credits**

This course teaches how to select, operate, install, maintain and repair the many types of pumps used by industry. Students learn the theory and practical application of all types of processed pumps and pipe systems. It covers types, components, and systems operation. It also covers troubleshooting for flow loss and cavitation. Students learn how to select, operate, install, maintain and repair the many types of pumps used by industry. Other topics covered include: Net Positive Suction Head, pump flow/head measurement, pressure head conversion, pressure flow characteristics, cavitation, series/parallel pump operation, mechanical seal/stuffing box maintenance, multi stage operation and construction, positive displacement pumps, turbine, diaphragm, peristaltic, piston, gear, and magnetic pump systems. Restricted to Carlsbad campus only.

**INMT 262. Piping Systems****2 Credits**

This course teaches students how to install, maintain and troubleshoot fluid systems such as how to select, size, identify, install a variety of types of piping, fittings, and valves. Measurement techniques from basic to precision measurement, gauging, including the fundamentals of demensioning and tolerancing will taught. Restricted to Carlsbad campus only.

**INMT 263. Mechanical Drives II****4 Credits**

This course teaches the bearings and gears used in heavy duty mechanical transmission systems. This course will emphasize linear access drives, clutches, and brakes. In addition, this course teaches how to set up, operate and apply laser shaft alignment to a variety of industrial applications. This course is a study of the basic concepts and procedures for the maintenance and operations of pumps, turbines, seals, bearings, and compressors. The course will provide the student with the knowledge and skills necessary to perform proper maintenance, repair, replacement and selection of pumps, turbines, seals, bearings and compressors. Also covered are advanced gearbox, coupling and bearings, precision alignment (shaft, flange, and sheave), as well as basic vibration analysis and thermography as troubleshooting and RCA aids. Restricted to Carlsbad campus only.

**INMT 264. Rigging****2 Credits**

This course teaches how to safely move loads of different shapes and sizes using a variety of different methods. Students will lift loads and demonstrate how to move it. Students will use hoists, slings, ropes and fittings to learn how to safely lift a wide variety of loads. Included are weight estimation, lifting rules, load ratings (sling, wire, ropes and hoists). Restricted to Carlsbad campus only.

**INMT 265. Hydraulics II****2 Credits**

This course teaches advanced hydraulics systems. The student will learn operation of advanced hydraulic systems applications, equipment installation, performance analysis of motors and pumps, accumulators, control, relief and check valve, equipment maintenance, and system design. The course covers accumulators, sequence valves, pilot circuits and unloader valves. Students learn more troubleshooting, hydraulic drives and other applications. Restricted to Carlsbad campus only.

**INMT 267. Pump Operations II****2 Credits**

This course teaches the student the disassembly, inspection and reassembly of centrifugal and positive displacement pumps. This course allows the student to identify and replace worn or broken components of pumps, and learn predictive and preventive maintenance principles. Lockout of the pump will be performed in addition to measurements and alignment. Restricted to Carlsbad campus only.

## INTR-INTERDISCIPLINARY STUDIES

**INTR 300. Foundations of Interdisciplinary Studies****3 Credits**

Introduction to Bachelor of Individualized Studies (BIS) and Bachelor of Applied Studies (BAS) degree programs. Explores roles of interdisciplinary studies in contemporary world and how emerging and perennial problems and issues can be comprehended utilizing multiple theoretical and analytic methods. Students design or update their course of study for earning the BIS or BAS degree. Consent of Instructor required. Restricted to Las Cruces campus only.

**INTR 301. Interdisciplinary Research: Theory & Practice****3 Credits**

Focuses on knowledge gained through interdisciplinary research. Students develop comprehensive understanding of steps of systematic inquiry into interdisciplinary research questions. Includes active learning through design and implementation of an interdisciplinary research project. For BIS and BAS majors only. Consent of Instructor required.

## JOUR-JOURNALISM (JOUR)

**JOUR 102. Grammar for Journalists****2 Credits**

Instruction of basic grammar, spelling and punctuation. Required for all journalism students with an ACT English score below 25, SAT Verbal below 570, or students who have not taken ACT/SAT tests. Restricted to Las Cruces campus only.

**JOUR 105G. Media and Society****3 Credits**

Functions and organization of the mass media system in the United States; power of the mass media to affect knowledge, opinions, and social values; and the impact of new technologies.

**JOUR 110. Introduction to Media Writing****3 Credits (2+2P)**

Preparation of copy for broadcasting, print, advertising, and public relations. Introduction to Web applications. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 102 or ACT score of 25 and above or SAT score of 570 and above.

**JOUR 201. Introduction to Multimedia****3 Credits**

Provide students with the basic skills to produce multimedia packages using text, photos, audio and video, as well as social media for professional purposes. Intensive hands-on class using editing software such as Adobe Premiere, Adobe Audition and Photoshop. May be repeated up to 3 credits.

**JOUR 210. Newswriting & Reporting****3 Credits (2+2P)**

Intensive laboratory practice in writing and field reporting news for print and Internet. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** JOUR 102 or ACT score of 25 and above or SAT score of 570 and above and JOUR 110.

**JOUR 300. Introduction to Advertising****3 Credits**

Role of IMC (integrated marketing communications) in marketing of goods, services, and organizations. Creative process, strategic planning media, message design, consumer behavior, and social issues of IMC.

**JOUR 302. Video Production****3 Credits**

Classroom instruction on basic studio and single camera video productions, with focus on practical aspects of news production. Lab experience in camera basics, studio functions and digital video editing. Includes practical experience through crew assignments on the live student-produced newscast, News22, which airs on KRWG-TV, a PBS affiliate station. May be repeated up to 3 credits.

**JOUR 306. Feature Writing****3 Credits**

The preparation of feature stories for newspapers and magazines. How to develop a variety of stories, research topics, interview sources, polish writing and market work. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits.

**Prerequisite(s):** JOUR 210 or consent of instructor.

**JOUR 310. News Reporting & Publishing****3 Credits**

Field reporting and news writing for print and Web applications. Instruction in community coverage, reporter responsibility, ethics and news values. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 210.

**JOUR 312. Advertising/Copywriting****3 Credits**

Creative process, strategic thinking, and principles of advertising in execution of copy, storyboards, and layouts for clients.

**Prerequisite(s):** JOUR 110 or consent.

**JOUR 314. Broadcast Reporting****3 Credits**

Writing, editing, producing, announcing and reporting of TV and radio news. May be repeated up to 3 credits.

**Corequisite(s):** JOUR 210.

**JOUR 315. News 22****1-3 Credits (1-3)**

Write, report, produce, anchor, shoot and edit video for live student television newscast airing on KRWG, public television for Southern New Mexico sports, weather, and news.

**Prerequisite(s):** JOUR 314 or JOUR 330 or instructor consent.

**JOUR 317. News Editing****3 Credits**

Extensive, directed practice in various aspects of computer editing for printed publication. Headline writing, copy editing, design, and layout.

**Prerequisite(s):** JOUR 210.

**JOUR 319. Intro Photography****3 Credits**

Introduction to photography emphasizing composition, basic camera technique, language of photography and storytelling. Photojournalism emphasis. Basic camera and processing techniques and skills. May be repeated up to 3 credits.

**JOUR 320. Photojournalism****3 Credits**

Communication photography for magazine, news, advertising/public relations and other communication needs. Digital Photography, lighting techniques, photo-editing software, and web site skills. Students provide camera and flash. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 319 or Consent of instructor.

**JOUR 321. Media Graphic Design****3 Credits**

Concepts and design skills useful for all aspects of journalism - print media and newsletters, basics of Photoshop and introduction to Web design. May be repeated up to 3 credits.

**JOUR 330. TV News Shooting & Editing****3 Credits (2+4P)**

Overview of technical and aesthetic skills and journalism basics needed for shooting and editing on-location news productions. Single camera videography and nonlinear/digital editing. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 302 or permission of instructor.

**JOUR 350. Media History****3 Credits**

Historical overview of mass media with emphasis on roots of journalism, technological developments, and American role in international media. May be repeated up to 3 credits.

**JOUR 374. Introduction to Public Relations****3 Credits**

Introduction to public relations as a communication process that builds relationships between organizations and their publics. Explores basic techniques, strategies, and tactics used in businesses, nonprofits, and in government.

**Prerequisite(s):** JOUR 110.

**JOUR 377V. Mass Media Ethics****3 Credits**

Philosophical and moral examination of problems relating to mass media. Use of case study method to analyze media situations; development of framework for media professionalism.

**JOUR 380. Women and the Media****3 Credits**

Portrayal and participation of women in mass media from colonial to contemporary times. Same as W S 450. May be repeated up to 3 credits.

**JOUR 399. New Mexico Law****3 Credits**

Same as C J 399, GOVT 399, HIST 399, and SOC 399.

**JOUR 407. Media Internship****1-3 Credits (1-3)**

Paid supervised work with a mass communications organization.

Students who take JOUR 407 may not take JOUR 408. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: Journalism majors.

**Prerequisite(s):** Consent of internship coordinator.

**JOUR 408. Media Practicum****1-3 Credits**

Advanced supervised work with a media organization. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of internship coordinator.

**JOUR 412. Documentary Photojournalism****3 Credits**

Production of documentary photography for web, print, books and exhibition emphasizing storytelling techniques. Multimedia and Web site techniques. Field Trips to produce material for the Small Village New Mexico project (SVNM). Produce Term projectbook. May be repeated up to 3 credits.

**Prerequisite(s):** JOUR 319.

**JOUR 414. RTV Scriptwriting/Performance****3 Credits**

Writing and delivery of news scripts for radio and television. Focus on anchoring announcing, voice technique and performance.

**Prerequisite(s):** JOUR 314 or consent of instructor.

**JOUR 425. Media Planning and Buying****3 Credits**

Covers the principles of media planning for an IMC campaign and procedures for purchasing ad time or space.

**Prerequisite(s):** JOUR 300 or consent of instructor.

**JOUR 427. Multimedia Publishing****3 Credits**

Writing-based course stresses the online telling of a story in many ways: text, photography, slide shows, audio and video news gathering, editing and posting.

**Prerequisite(s):** JOUR 201.

**JOUR 460. Public Relations Promotion in Sports****3 Credits**

Examination of sports as a business and how public relations promotion is executed in professional sports franchises.

**JOUR 476. Public Relations Campaigns****3 Credits**

Utilizing the principles and techniques of public relations to research and develop a comprehensive plan for a long-term national, regional, or local campaign. May be repeated up to 3 credits. Restricted to: Restricted to Journalism majors.

**Prerequisite(s):** JOUR 210, JOUR 374.

**JOUR 484. Public Opinion****3 Credits**

Seminar on forces which help form public opinion; individual projects in attitude measurement; measuring effectiveness of mass communication.

**JOUR 489. Media Research****3 Credits**

Examination of the role of empirical research in solving mass communication problems. Survey techniques, field studies, content analysis, data analysis. May be repeated up to 3 credits.

**JOUR 490. Advertising Campaigns****3 Credits**

Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local IMC (Integrated Marketing Communications) campaign. Consent of instructor required.

**Prerequisite(s):** JOUR 300 and 312 or consent of instructor.

**JOUR 493. Media Law****3 Credits**

Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, GOVT 493. May be repeated up to 3 credits.

**JOUR 494. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes.

**JOUR 495. Mass Communication Theory****3 Credits**

Theoretical approaches to mass communications. Examination of media effects, audiences, media socialization.

**JOUR 499. Independent Study in Media****1-3 Credits**

Individual study directed by consenting instructor with prior approval of department head. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s):** 2.5 GPA and consent of instructor.

## JPNS-JAPANESE (JPNS)

**JPNS 111. Elementary Japanese I****4 Credits**

Japanese language for beginners.

**JPNS 112. Elementary Japanese II****4 Credits**

Japanese language for beginners.

**Prerequisite:** grade of C or better in JPNS 111 or consent of instructor.

**JPNS 211. Intermediate Japanese I****3 Credits**

Speaking, reading and writing the Japanese language.

**Prerequisite:** grade of C or better in JPNS 112 or consent of instructor.

**JPNS 212. Intermediate Japanese II****3 Credits**

Speaking, reading and writing the Japanese language.

**Prerequisite:** grade of C or better in JPNS 211 or consent of instructor.

**JPNS 320. Oral Practicum in Japanese****1-3 Credits**

Service training for facilitators leading informal conversation groups in Japanese. May be repeated for a maximum of 4 credits.

**Prerequisites:** fluency in Japanese and consent of instructor.

**JPNS 453. Independent Studies in Japanese****1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students.

## L SC-LIBRARY SCIENCE (L SC)

**L SC 100. Introduction to Libraries****3 Credits**

Overview of libraries, including history and development, responsibilities of library personnel, types of libraries and services, and technology and trends. Restricted to Dona Ana campus only.

**L SC 110. Reference and Information Resources I****3 Credits**

Overview of reference services. Introduction to, and evaluation of, basic types of information resources (both print and electronic) and their application in libraries.

**L SC 111. Introduction to Information Literacy in an Electronic Environment****3 Credits**

Introduction to the basics of the research process; the organization, location and evaluation of information using print, non-print and electronic resources. Restricted to: Community Colleges only.

**L SC 112. Introduction to Consumer Health Information Literacy in an Electronic Environment****3 Credits**

Introduction to consumer health information literacy; the process and organization, location, and evaluation of online information. Restricted to: Community Colleges only.

**L SC 120. Cataloging Basics I: Descriptive Cataloging****3 Credits**

Introduction to descriptive cataloging. Restricted to: Dona Ana campus only.

**L SC 125. Cataloging Basics II: Classification and MARC Cataloging****3 Credits**

Continuation of descriptive cataloging basics. Introduction to subject analysis, classification and MARC coding. Restricted to: Dona Ana campus only.

**L SC 130. Introduction to Technical Services in Libraries****3 Credits**

Introduction to technical services in libraries, including acquisitions, bindery, cataloging, gifts, and serials. Restricted to Dona Ana campus only.

**L SC 140. Multimedia Materials and Presentations in Libraries****3 Credits**

Overview of media formats and equipment. Introduction to desktop publishing, presentations, and web-page creation applications in libraries.

Restricted to: Community Colleges only.

**L SC 150. Library Services for Children and Young Adults****3 Credits**

Library services for children and young adults with an overview of materials, programs, and services for this population. Restricted to: Dona Ana campus only.

**L SC 153. Picture Books and Young Children****1 Credit**

If children are to enjoy reading they need to be exposed to books at an early age. This course will provide information to help guide librarians, preschool teachers, parents, and care givers in choosing appropriate books for those younger than six, and how to use books with this age group. Restricted to Dona Ana campus only.

**L SC 154. State Children's Book Awards****1 Credit**

Students will explore the state book award offered by their state. Students will read some of the books and plan library programs to promote the award. Restricted to: Dona Ana campus only.

**L SC 155. Award Winning Books for Children****1 Credit**

A review of book awards and how to integrate award winning books into school curriculum or public school programming. Restricted to: Community Colleges only.

**L SC 156. Boys and Books****1 Credit**

This course looks at why, in general, boys are less interested in books than girls. Students will discover ways libraries can encourage boys to read and develop activities and programs which entice them to do so. Students will also be reading some books recommended for boy readers. Restricted to Dona Ana campus only.

**L SC 160. Introduction to Public Services in Libraries****3 Credits**

Introduction to public services in libraries, including circulation, inter-library loan, reference, media services, special collections, and government documents. Restricted to Dona Ana campus only.

**L SC 175. Civic Involvement in Library Science****1-3 Credits**

Involvement in an organized community service project or group with a library or information technology component. Promotes awareness of volunteer and community service opportunities. May be repeated for a maximum of 6 credits. Graded: S/U. Restricted to: Dona Ana campus only.

**L SC 191. Children's Books and their Movie Adaptations****1 Credit**

For almost as long as there have been popular books for children in the United States, there have been dramatic adaptations of them. What is gained, and lost, when children's books are adapted for the big screen? What is the relationship-or what should the connection be-between works of children's literature and their seemingly inevitable film adaptations? Students will be expected to read several children's books and view the movies based on them and make comparisons. Restricted to: Community Colleges only.

**L SC 192. Myths and Legends in Children's Literature****1 Credit**

The student will explore myths and legends from diverse cultures; from European and Asian to those who have their roots in Africa and the Americas. Myths which are similar across several cultures will be compared.

**L SC 193. Poetry for Children****1 Credit**

This course will explore the genre of poetry for children. In this class, participants will focus on reading and reviewing poetry for kids, exploring poetry on the Web, and trying interactive approaches for sharing poetry with children. Topics include: study and analysis of poetry, ways to use poetry in the classroom, writing poetry with children. Restricted to: Community Colleges only.

**L SC 195. Mysteries for Children****1 Credit**

In this course the student will become familiar with a wide variety of mysteries for children. Ways to use mysteries in the classroom and school library will also be covered. Restricted to Community Colleges campuses only.

**L SC 196. Historical Fiction for Children****1 Credit**

This course looks at historical fiction as a genre. Topics include: fiction vs. history, American history in children's literature, world history in children's literature, activities for using historical fiction in a school setting. Restricted to: Community Colleges only.

**L SC 197. Fantasy and Speculative Fiction****1 Credit**

This course offers professionals serving school students the opportunity to increase your appreciation and knowledge of fantasy and speculative fiction through intense reading and discussion of representative works. The course will also investigate and consider options using fantasy and speculative fiction in a school setting. Restricted to: Community Colleges only.

**L SC 200. Collection Management and Development in Libraries****3 Credits**

Principles of identifying, selecting, acquiring, managing, and evaluating resources for libraries. Restricted to Dona Ana campus only.

**L SC 201. Public Libraries****3 Credits**

A study of the American public library and its place in communities. Topics may include history, philosophy, and standards, operations and procedures, governance, funding, personnel materials, user services, outreach and advocacy. Restricted to: Dona Ana campus only.

**L SC 203. School Library Media Specialist****3 Credits**

Principles and practice of managing the school library media center, with an emphasis on its specific educational mission. Topics may include collection development, classes and lesson plans, public relations, administrative procedures, and use of technology. Restricted to Dona Ana campus only.

**L SC 210. Technology Planning in Libraries****3 Credits**

Overview of computer applications in libraries. Topics may include automated systems and electronic resources, introduction to evaluation of technology, and writing a technology plan. Restricted to Dona Ana campus only.

**L SC 220. Innovative Technology Applications for Libraries****3 Credits**

A look at uses for innovative technologies in libraries. Topics may include blogs, wikis, podcasting and virtual reality libraries. Restricted to Dona Ana campus only.

**L SC 221. Experiential Learning I****1-3 Credits**

Student is employed (paid or non-paid) in an approved work site and evaluated by their supervisor. Each credit requires a specified number of hours of on-the-job work experience. Consent of Instructor required. S/U Grading (S/U, Audit). Restricted to Dona Ana campus only.

**Prerequisite(s):** Consent of instructor.

**L SC 222. Experiential Learning II****1-3 Credits**

Continuation of L SC 221. Each credit requires specified number of hours of on-the-job work experience. Consent of Instructor required. S/U Grading (S/U, Audit). Restricted to Dona Ana campus only.

**Prerequisite(s):** L SC 221 and consent of instructor.

**L SC 230. Issues and Ethics in Libraries****3 Credits**

Discussions of current and continuing challenges to effective library service. Topics may include copyright, censorship, intellectual freedom, Internet filtering, problem patrons, security, or other current issues. Restricted to Dona Ana campus only.

**L SC 234. Intellectual Freedom in Libraries****1 Credit**

Philosophical and practical information related to library policies about access to library materials. Restricted to: Dona Ana campus only.

**L SC 236. Banned Books****1 Credit**

Banned books, selection policies, and responding to challenges. Restricted to: Dona Ana campus only.

**L SC 240. Internet Resources and Research Strategies****3 Credits**

Introduction to retrieving and evaluating information found on the Internet and in selected Internet-accessible databases. Restricted to: Dona Ana campus only.

**L SC 250. Reference and Information Resources II****3 Credits**

Evaluation and use of specialized information resources to offer reference services. Emphasis is on virtual reference and other innovative techniques. Restricted to: Dona Ana campus only.

**L SC 255. Special Topics****1-3 Credits**

Special topics to be announced in Schedule of Classes. May be repeated for a maximum of 12 credits. Restricted to: Dona Ana campus only.

**L SC 260. Cataloging Non-Book Formats****3 Credits**

Introduction to cataloging of various non-book formats and MARC coding. Restricted to: Dona Ana campus only.

**L SC 270. Library Science Capstone****3 Credits**

A culmination of all technical courses that are required to receive an Associate of Applied Science from the program centering around the completion of a library related project. Discussions on the role of paraprofessionals in libraries. Restricted to: Dona Ana campus only.

**L SC 275. Fundamentals of Library Supervision****3 Credits**

An introduction to supervision of library employees, including student assistants, to create a productive workplace. Restricted to: Dona Ana campus only.

**L SC 281. Grant Writing for Libraries****1 Credit**

Introduction to grant writing for libraries. Restricted to: Dona Ana campus only.

**L SC 286. Children's Literature and the Primary Curriculum****3 Credits**

The student will research the use of picture books and other children's literature across the curriculum with students in kindergarten through second grade. Topics include: using literature to teach writing, using literature to teach science, using literature to teach math, using literature to teach social studies. Restricted to: Community Colleges only.

**L SC 287. Children's Literature and the Intermediate Curriculum****3 Credits**

The student will research the use of picture books and other children's literature across the curriculum with students in grades three through five. Topics include: using literature to teach writing, using literature to teach science, using literature to teach math, using literature to teach social studies. Restricted to: Community Colleges only.

**L SC 288. Children's Literature and the Middle School Curriculum****3 Credits**

The student will research the use of picture books and other children's literature across the curriculum in grades six through eight. Topics include: using literature to teach writing, using literature to teach science, using literature to teach math, using literature to teach social studies. Restricted to: Community Colleges only.

**L SC 290. Introduction to Children's Literature for Libraries****3 Credits**

This course will introduce current and potential library personnel to a wide variety of literature written for children. The course explores the history of children's literature and the path it has taken. Students will read many books from a variety of genre, explore the literary elements found in those books, and develop some evaluation criteria and ways for children to respond to the literature they read. Restricted to Dona Ana campus only.

**L SC 291. Southwestern Children's Literature****1 Credit**

This course will introduce students to books which can teach the children visiting your library more about the people and places of the southwest. Restricted to: Dona Ana campus only.

**L SC 292. Native American Children's Literature****1 Credit**

This course will introduce students to some children's and young adult books written by and about Native Americans. Restricted to: Dona Ana campus only.

**L SC 295. Introduction to Young Adult Literature****3 Credits**

The course will expose students to quality adolescent literature available for reading and study in middle and high school classes. It provides a broad survey of young adult literature and focuses on building an appreciation of literature, encouraging student reading, developing life-long readers, and developing activities for critical thinking. Restricted to: Community Colleges only.

**L SC 296. Multicultural Books for Children and Youth****3 Credits**

This course explores a wide range of multicultural children's literature including: African American, Native American, Latino, Asian, Jewish, and Middle Eastern. Topics covered include: nonfiction of the cultures, historical fiction of the cultures, and contemporary literature of the cultures. Restricted to: Community Colleges only.

**L SC 298. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with prior approval of department chair. May be repeated for a maximum of 12 credits. Restricted to: Dona Ana campus only.

**LANG-LANGUAGE (LANG)****LANG 111. Beginning Language I****4 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.

**Prerequisite:** Language placement exam or consent of the instructor.

**LANG 112. Beginning Language II****4 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.

**Prerequisite:** Language placement exam or consent of instructor.

**LANG 211. Intermediate Language I****3 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles.

**LANG 212. Intermediate Language II****3 Credits**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles.

**Prerequisite:** Language placement exam or consent of instructor.

**LANG 451. Special Topics****1-3 Credits**

Selected topics relating to cultures or literatures of a specific country. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. May be repeated for a maximum of 12 credits. Consent of instructor required.

**LANG 453. Independent Studies****1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated under different subtitles for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**LAWE-LAW ENFORCEMENT (LAWE)****LAWE 201. Introduction to Juvenile Delinquency****3 Credits**

An introductory overview of the juvenile justice system of due process, custody, detention and release. Note: course does not meet upper division requirements towards completion of Bachelor of Science in Criminal Justice. Restricted to: Community Colleges Only.

**LAWE 202. Police Patrol Procedures****3 Credits**

A critical review of police procedures and the influences on police behavior; policy development, including the police role; discretion; police community interaction and arrest, search and seizure. Restricted to: Community Colleges only.

**LAWE 203. Introduction to Police Supervision****3 Credits**

An introductory overview of police supervision and concerns as it applies to law enforcement. (Note: Course does not meet upper division requirements toward completion of Bachelor of Science in Criminal Justice.) Restricted to: Community Colleges only.

**LAWE 204. Introduction to Homeland Security****3 Credits**

A historical perspective of international and domestic terrorist threats and the need to develop cohesive response policies and practices in the interest of National Security. [Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice.]

Restricted to: Community Colleges only.

**Prerequisite(s):** C J 101.

**LAWE 205. Practical Field Investigations****4 Credits (3+3P)**

Incorporates the current methods and techniques for the management of the crime scene, includes documentation, collection and preservation of evidence and case presentations. [Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice.]

Restricted to Community Colleges campuses only.

**Prerequisite(s):** C J 101 and C J 221.

**LAWE 206. Traffic Enforcement and Crash Investigations****3 Credits**

History and development of traffic laws and regulations, including basic elements of traffic violations, detection, apprehension, impaired drivers and guidelines and procedures for effective crash investigations and reporting. Restricted to: Community Colleges only.

**LAWE 207. Legal Aspects of Law Enforcement****3 Credits**

An evaluation of police authority including responsibilities, civil liability, liability implications, legal obligations, legal restraints, laws of arrest, and search and seizure. Restricted to: Community Colleges only.

**LAWE 221. Law Enforcement Internship****3 Credits**

Application of knowledge, skills and abilities, in an agency as an intern and integrated member of a law enforcement affiliated agency.

**Prerequisite:** consent of instructor.

**LAWE 233. Practical Approach to Terrorism****3 Credits**

Gives responders an overall safety approach in recognizing and responding to incidents involving terrorism. Presents and overview in types of harm, explosive weapons, chemical weapons, biological weapons and radiological weapons. [Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice.]

Restricted to: Dona Ana campus only. Crosslisted with: FIRE 233

## LIB-LIBRARY SCIENCE (LIB)

### LIB 101. Introduction to Research

#### 1 Credit

A practical, hands-on, step-by-step introduction to the basics of university-level library research. Topics include the academic method, plagiarism, selection and use of information resources. (Eight-week course.)

### LIB 111. Introduction to Information Literacy in an Electronic Environment

#### 3 Credits

Introduction to the basics of the research process; the organization, location and evaluation of information using print, non-print and electronic resources; and techniques of effective personal information management in a computerized setting. Uses a combination of active and hands-on learning methods as well as lectures.

### LIB 311V. Information Literacy

#### 3 Credits

Lecture, hands-on assignments, and written research projects to give students the technological skills and critical thinking abilities needed to use the printed and electronic information resources found on the Information Highway. Includes how to locate, critically evaluate, and apply information for academic, professional, and personal purposes.

**Prerequisite:** ENGL 111G or equivalent; and consent of instructor.

## LING-LINGUISTICS (LING)

### LING 200G. Introduction to Language

#### 3 Credits

Traditional fields of language study (sound, grammar, meaning) and newer ones (language as social behavior, language and cognition, language variation, animal communication).

### LING 301. Introduction to Psycholinguistics

#### 3 Credits

Same as PSY 301.

### LING 302V. Language and Society

#### 3 Credits

Study of how social identity including such factors as ethnicity, age, sex, education, power and socio-economic class is expressed in language systems and how misunderstandings arise between groups. Research skills are emphasized.

### LING 303. Exploring Language Systems

#### 3 Credits

Forms of linguistic semantic, syntactic and phonological organization.

**Prerequisite(s):** LING 200G.

### LING 405. Topics in Linguistics

#### 3 Credits

Selected linguistics topics subtitled in the Schedule of Classes. May be repeated for a maximum of 6 credits under different subtitles.

**Prerequisite:** consent of instructor.

### LING 425. Language and the Mind: Introduction to Psycholinguistics

#### 3 Credits

This course is an introduction to psycholinguistics; the study of how humans learn, represent, comprehend and produce language. Throughout this course, we address a variety of questions on the psychology of language most of which are still being answered. These include: What does it mean to know a language? What are the cognitive processes involved in language use? How do we produce and recognize speech? How can we improve texts and make them easier to read? How can we control speech in special situations to avoid errors?

**Prerequisite(s):** LING 200G or consent of instructor.

### LING 451. Independent Studies in Linguistics

#### 1-3 Credits

Individual or group study of selected topics to be identified by subtitle.

May be repeated for a maximum of 6 credits.

**Prerequisites:** LING 200G and prior arrangement with faculty supervisor.

### LING 455. Research in Linguistics

#### 3 Credits

This course will provide a capstone experience for students who have progressed through the program in linguistics and provide the foundation for further study at the post-graduate level in a linguistics-related field.

Students will apply their foundation of knowledge and skills in linguistics through the realization of an individualized, inquiry-based project.

Consent of instructor may enroll student only in case of elective credit shortfall with concurrent enrollment.

**Prerequisite(s):** LING 200G, LING 301, LING 302V, LING 303, plus 9 credit hours of related electives.

### LING 500. Introduction to Linguistics

#### 3 Credits

Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics and some of the theoretical issues in the field.

### LING 502. Graduate Study in Sociolinguistics

#### 3 Credits

Study of how social identity including factors such as ethnicity, age, gender education and socio-economic class is expressed in language systems.

**Prerequisites:** LING 200G or LING 500 recommended.

### LING 503. Exploring Language Systems- Grad

#### 3 Credits

Students will be responsible for all requirements of LING 303 and will undertake independent, directed research.

**Prerequisite(s):** LING 200 or LING 500.

### LING 505. Selected Topics

#### 3 Credits

Studies, varying from year to year, in linguistics.

## M E-MECHANICAL ENGINEERING (M E)

### M E 102. Mechanical Engineering Orientation

#### 1 Credit

Emphasis on tours of M E labs and NMSU facilities that illustrate possible career paths for mechanical engineers. Students are introduced to department faculty, student organizations, and support services at NMSU. Topics include role of good communication skills, using modern technology, team building, and intellectual property. Students are advised in planning balance of their academic program. Restricted to majors.

**M E 159. Graphical Communication and Design****2 Credits (1+3P)**

Sketching and orthographic projection. Covers detail and assembly working drawings, dimensioning, tolerance specification, and design projects. Pre/

**Corequisite(s):** MATH 190G.

**M E 201. Supplemental Instruction to Dynamics****1 Credit**

Optional workshop for students in M E 237. The workshop focuses on problem solving skills associated with M E 237. Course does not count toward departmental degree requirements. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

**Corequisite(s):** M E 237.

**M E 202. Supplemental Instruction to Thermodynamics****1 Credit**

Optional workshop for students in ME 240. The workshop focuses on problem solving skills associated with ME240. Course does not count toward departmental degree requirements. Restricted to Las Cruces campus only.

**Corequisite(s):** M E 240.

**M E 210. Electronics and System Engineering****3 Credits (2+3P)**

Introduction to microcontrollers, measurement systems, motion actuators, sensors, electric circuits, and electronic devices and interfacing. Students required to work individually and in teams to design and test simple electromechanical systems. Restricted to Las Cruces campus only.

**Prerequisite(s):** MATH 192.

**M E 222. Introduction to Product Development****3 Credits (2+3P)**

Introduction to modern methods used in the realization of products. Traditional manufacturing processes, such as metal stamping, turning, milling, and casting are reviewed. Modern methods of rapid prototyping and model making are discussed in context of computer-aided design. Techniques for joining metals, plastics, and composites are discussed. Role of quality control is introduced.

**Prerequisite:** M E 159.

**M E 228. Engineering Analysis I****3 Credits**

Introduction to engineering analysis with emphasis on engineering applications. Topics include ordinary differential equations, linear algebra, and vector calculus with focus on analytical methods. Restricted to Las Cruces campus only.

**Prerequisite(s):** MATH 291.

**M E 234. Mechanics-Dynamics****3 Credits**

Kinematics and dynamic behavior of solid bodies utilizing vector methods.

**Prerequisite(s)/Corequisite(s):** MATH 291G. Prerequisite(s): C E 233.

**M E 236. Engineering Mechanics I****3 Credits**

Force systems, resultants, equilibrium, distributed forces, area moments, friction, and kinematics of particles. Pre/ Restricted to: Main campus only.

**Prerequisite(s):** MATH 192G.

**Corequisite(s):** PHYS 215G.

**M E 237. Engineering Mechanics II****3 Credits**

Kinetics of particles, kinematics and kinetics rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies in three dimensions. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 291. Prerequisite(s): M E 236 or C E 233.

**M E 240. Thermodynamics****3 Credits**

First and second laws of thermodynamics, irreversibility and availability, applications to pure substances and ideal gases.

**Prerequisite:** PHYS 215G.

**M E 261. Mechanical Engineering Problem Solving****3 Credits (2+3P)**

Introduction to programming syntax, logic, and structure. Numerical techniques for root finding, solution of linear and nonlinear systems of equations, integration, differentiation, and solution of ordinary differential equations will be covered. Multi function computer algorithms will be developed to solve engineering problems.

**Prerequisite(s):** MATH 192.

**M E 301. Supplemental Instruction to Engineering Analysis II****1 Credit**

Optional workshop for students in ME 328. The workshop focuses on problem solving skills associated with ME328. Course does not count toward departmental degree requirements. May be repeated up to 1 credits.

**Corequisite(s):** M E 328.

**M E 302. Fluids Supplemental Instruction****1 Credit**

Optional workshop for students in ME 338 or AE 339. The workshop focuses on problem solving skills associated with fluid mechanics. Course does not count toward departmental degree requirements.

**Corequisite(s):** M E 338 or A E 339.

**M E 326. Mechanical Design****3 Credits**

Design methodology and practice for mechanical engineers. May be repeated up to 3 credits.

**Prerequisite(s):** M E 234 or M E 237 and C E 301.

**M E 328. Engineering Analysis II****3 Credits**

Advanced engineering analysis with emphasis on engineering applications. Topics include systems of ordinary differential equations, Fourier analysis, partial differential equations, and functions of complex variable with focus on analytical methods. May be repeated up to 3 credits.

**Prerequisite(s):** M E 228 or MATH 392.

**M E 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Restricted to: Main campus only. Restricted to M E majors. Crosslisted with: C E 330, CH E 330, E E 330, E S 330, I E 330, WERC 330 and E T 330

**M E 331. Intermediate Strength of Materials****3 Credits**

Covers stress and strain, theories of failure, curved flexural members, flat plates, pressure vessels, buckling, and composites. May be repeated up to 3 credits.

**Prerequisite(s):** C E 301 and M E 328 or MATH 392.

**M E 332. Vibrations****3 Credits**

Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange's equations. Dynamic stability. Controls. Matrix iteration. May be repeated up to 3 credits.

**Prerequisite(s):** M E 328, M E 234 or M E 237, and M E 261.

**M E 333. Intermediate Dynamics****3 Credits**

Three dimensional kinematics and kinetics, orbital motion, Lagrange's equations, dynamic stability, and controls. May be repeated up to 3 credits.

**Prerequisite(s):** M E 328 and M E 234 or M E 237.

**M E 338. Fluid Mechanics****3 Credits**

Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations continuity, energy, and momentum to fluid systems. May be repeated up to 3 credits. Restricted to: M E majors.

**Prerequisite(s):** M E 234 or M E 237 and M E 228 or MATH 392.

**M E 340. Applied Thermodynamics****3 Credits**

Thermodynamic cycles, Maxwell relations, Gibbs and Helmholtz functions, mixtures, psychometrics, chemical reactions, chemical equilibrium.

**Prerequisite:** M E 240.

**M E 341. Heat Transfer****3 Credits**

Fundamentals of conduction, convection, and radiation. Design of heat transfer systems. May be repeated up to 3 credits.

**Prerequisite(s):** M E 240, M E 338 or A E 339, and M E 228 or MATH 392.

**M E 345. Experimental Methods I****3 Credits (2+3P)**

Emphasis on experimental techniques, basic instrumentation, data acquisition and analysis, and written presentation of results. Includes experiments in dynamics and deformable body mechanics. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** C E 301. **Prerequisite(s):** M E 228 or MATH 392, M E 210, and M E 234 or M E 237.

**M E 349. MAE Career Seminar****1 Credit**

Seminar course covering topics relevant to mechanical and aerospace engineering juniors (job placement, interviewing techniques, resume preparation, etc.). Restricted to: M E and A E majors.

**Prerequisite(s):** Junior Standing.

**M E 400. Undergraduate Research****1-3 Credits**

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of faculty member.

**M E 401. Heating/Air-Conditioning System****3 Credits**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. May be repeated up to 3 credits.

**Prerequisite(s):** M E 340 and M E 341.

**M E 405. Special Topics****3 Credits**

Topics of modern interest to be offered by the departmental staff. May be repeated up to 12 credits.

**Prerequisite(s):** Senior standing.

**M E 425. Design of Machine Elements****3 Credits**

Design of machine elements through the application of mechanics. Fatigue and theories of failure. Design projects assigned.

**Prerequisite(s):** M E 326.

**M E 426. Design Project Laboratory I****3 Credits**

Students address a design problem in which innovation and attention to detail are emphasized. Solution of the problem entails applications of mechanics and/or the thermal sciences.

**Prerequisite(s)/Corequisite(s):** M E 425.

**M E 427. Design Project Laboratory II****3 Credits**

Continuation of M E 426.

**Prerequisite:** M E 426.

**M E 445. Experimental Methods II****3 Credits (2+3P)**

Emphasis on experimental techniques, instrumentation and data acquisition in fluid mechanics, heat transfer, and thermodynamics. Laboratory results will be presented in written and verbal formats.

**Prerequisite(s):** (M E 338 or A E 339), M E 340, M E 341, and M E 345.

**M E 449. Mechanical Engineering Senior Seminar****1 Credit**

Senior seminar course covering topics relevant to graduating mechanical engineering seniors (job placement, interviewing techniques, resume preparation).

**Prerequisite:** senior standing.

**M E 452. Introduction to Automation and Control System Design****3 Credits (2+3P)**

Control system design and implementation. Emphasis on practical applications of traditional control algorithms to mechanical engineering applications in thermofluid systems and mechanical systems. Design of feedback analog and digital control systems. Introduction to robots and automation. Lab assignments include programming industrial robotic and automation systems. May be repeated up to 3 credits.

**Prerequisite(s):** M E 328 and M E 234 or M E 237, or consent of instructor.

**M E 456. Experimental Modal Analysis****3 Credits**

Emphasis on hands-on techniques for structural vibration tests for practical applications. Interpretation of experimental results by means of advanced signal processing tools, basic system identification methodology, and reduced-order modeling procedures. May be repeated up to 3 credits.

**Prerequisite(s):** M E 332, M E 228 or MATH 392, and M E 261, or consent of instructor.

**M E 460. Applied Finite Elements****3 Credits**

Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process. May be repeated up to 3 credits.

**Prerequisite(s):** M E 425.

**M E 481. Alternative and Renewable Energy****3 Credits**

Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed.

**Prerequisite(s):** M E 341, and (M E 338 or A E 339).

**M E 483. Introduction to Combustion****3 Credits**

Combustion is one of the most fundamental phenomena related to human activities, such as obtaining thermal energies. Fundamental phenomena and physics related to combustion will be discussed, including thermodynamics, chemical reactions; combustion kinetics, premixed and diffuse flames, and examples. May be repeated up to 3 credits.

**Prerequisite(s):** CHEM 112G, M E 228 or MATH 392, and M E 340.

**M E 487. Mechatronics****3 Credits (2+3P)**

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. May be repeated up to 3 credits.

**Prerequisite(s):** M E 210 or E E 201 and M E 345.

**M E 502. Elasticity I****3 Credits**

Introduction to stress tensor, strain tensor, constitutive law, energy theorems, plane stress and plane strain. Also covers torsion of shafts and propagation of stress waves in elastic solids.

**M E 503. Thermodynamics****3 Credits**

A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.

**M E 504. Continuum Mechanics****3 Credits**

Basic introduction to the Mechanics of Continuous Media. Its aim is to prepare the student for more advanced courses in Solid and Fluid Mechanics. The topics to be covered include: introduction to Cartesian tensors, tensor algebra and calculus; Lagrangian and Eulerian kinematics; Cauchy and Piola-Kirchhoff stresses; general principles of conservation; constitutive theory for ideal fluids, Newtonian and non-Newtonian fluids, finite and linear elasticity.

**M E 505. Fundamentals of the Theory of Plasticity****3 Credits**

Basic concepts in continuum mechanics, equations of the plastic state, equations of elastic-plastic equilibrium, criteria for yielding, initial and subsequent yield surfaces, two-dimensional and axi-symmetric plasticity problems, dynamic problems.

**Prerequisite(s):** M E 502.

**M E 509. Individualized Study****3 Credits**

Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.

**M E 510. Special Topics****1-6 Credits**

Topics in mechanical engineering. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of the department head.

**M E 511. Dynamics****3 Credits**

An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics.

**M E 512. Vibrations****3 Credits**

Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.

**M E 514. Advanced Composite Materials****3 Credits**

Study on the anisotropic elasticity, strength of anisotropic materials and micromechanics. Topics from micromechanics and macromechanics through lamination theory and examples of plate bending, buckling and vibration problems. Course taught on an as-needed basis.

**M E 517. Nonlinear Dynamics and Chaos****3 Credits**

Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincare maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos

**M E 518. Finite Element Analysis****3 Credits**

Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis.

**M E 520. Micromechanics****3 Credits**

The course covers fundamentals of micromechanics: point force solution, Eshelby's problem, various approximate methods to calculate effective material properties of inhomogeneous materials, variational principles of the mechanics of composites. The history of micromechanics is discussed from Navier and Cauchy to current state of the art.

**Prerequisite(s):** M E 502.

**M E 527. Control of Mechanical Systems****3 Credits**

Rigorous introduction to the control of dynamical systems, with a focus on mechanical systems. Includes basic systems theory, controllability, feedback and stabilization, observers and dynamic feedback, and applications of methods to systems of importance in mechanical engineering. Consent of Instructor required. Crosslisted with: A E527.

**Prerequisite(s):** M E 452 or equivalent, or consent of instructor.

**M E 529. Nonlinear and Optimal Control****3 Credits**

Introduction to optimal control theory, Pontryagin's Maximum Principle, control of simple mechanical systems, Lagrangian and Hamiltonian methods, introduction to geometric control-Lie algebras, distributions, controllability and observability

**M E 530. Intermediate Fluid Mechanics****3 Credits**

Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.

**M E 533. Computational and Theoretical Fluid Mechanics****3 Credits**

Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data.

**Prerequisite:** M E 530 or consent of instructor.

**M E 534. Advance Computational Fluid Dynamics****3 Credits**

Advanced techniques for large-scale numerical simulations of fluid flows: spectral numerical methods, including Fourier and other expansions, Galerkin and collocation projections, computational methods to solve incompressible and compressible Navier-Stokes equations, high-resolution methods for hyperbolic equations with discontinuous solutions, and issues related to implementation on supercomputers.

**Prerequisite(s):** M E 533.

**M E 536. Hydrodynamic Stability and Turbulence****3 Credits**

Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory

**Prerequisite(s):** M E 533.

**M E 540. Intermediate Heat Transfer****3 Credits**

Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level.

**M E 570. Engineering Analysis I****3 Credits**

Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods.

**M E 580. Engineering Analysis II****3 Credits**

Engineering analysis with emphasis on engineering applications. Topics include analytical and numerical methods in linear and nonlinear ordinary and partial differential equations.

**Prerequisite:** M E 570 or consent of instructor.

**M E 598. Special Research Programs****1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.

**M E 599. Master's Thesis****15 Credits**

Thesis.

**M E 600. Doctoral Research****1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

**M E 698. Special Research Programs****1-3 Credits**

May be repeated for a maximum of 6 credits.

**M E 700. Doctoral Dissertation****15 Credits**

Dissertation.

## M SC-MILITARY SCIENCE (M SC)

**M SC 110. Introduction to Military Science****2 Credits (2+1P)**

Concepts of leadership, including basic drill, fitness sessions, rappelling, first aid, map reading, and basic marksmanship. Optional physical fitness sessions and weekend exercises.

**M SC 111. Introduction to Leadership****2 Credits (2+1P)**

Learning and application of leadership, as well as relating organizational ethics to effective leadership using communication skills to improve individual performance. Optional physical fitness sessions and weekend exercises.

**M SC 210. Self/Team Development****3 Credits (3+1P)**

Learning and application of leadership skills to building effective teams, using oral/written skills, planning, and coordination of group efforts. Include advanced first aid, land navigation, and basic military tactics. Leadership Lab and three physical fitness sessions per week required.

**M SC 211. Leadership in Action and Team Building****3 Credits (3+1P)**

Individual and team aspects of military tactics in small unit operations. Use of radio, movement, planning for safety/security and pre-execution checks. Continued leadership development and techniques for training others. Leadership Lab and three physical fitness sessions per week required.

**M SC 225. Directed Studies****1-3 Credits**

Individual directed studies under supervision of designated faculty. May be repeated for a maximum of 12 credits. No S/U option.

**Prerequisite:** GPA 2.5 or better.

**M SC 310. Leading Small Organizations I****3 Credits**

Practical opportunities to lead small groups in situations of graduated complexity. Use of small unit defensive tactics and opportunities to conduct training for lower division students. Leadership Lab M SC 310L, three physical fitness sessions per week, and weekend exercises required.

**Prerequisite:** must meet Basic Course of Military Science requirements.

**Corequisite:** M SC 310L.

**M SC 310 L. Advanced Course Leadership Laboratories****1 Credit**

Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 310.

**Corequisite:** M SC 310.

**M SC 320. Leading Small Organizations II****3 Credits**

Delegation and supervision based on leadership case studies that require planning and adaptation to the unexpected in organizations under stress. Use of ethical decision making to enhance team performance. Leadership Lab M SC 310L, three physical fitness sessions per week, and weekend exercises required.

**Prerequisite:** M SC 310 or consent of instructor.

**Corequisite:** M SC 320L.

**M SC 320 L. Leading Small Organization Lab****1 Credit**

Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open to students taking M SC 320.

**Corequisite:** M SC 320.

**M SC 325. Advanced Directed Studies****1-3 Credits**

Directed individual study of advanced subjects. May be repeated for a maximum of 12 credits. No S/U option.

**Prerequisite:** GPA 2.5 or better.

**M SC 350. Leadership Internship II****1-6 Credits (1-6)**

Six-week paid internship conducted at an Army installation. Leadership-course environment is highly structured and demanding. Stresses leadership at small-unit levels under varying conditions. Evaluations during this required internship weigh heavily in type of commission and branch assignment offered.

**Prerequisite(s):** M SC 310, M SC 310L, M SC 320, and M SC 320L.

**M SC 401. Leadership Challenges and Goal Setting****3 Credits**

Planning, conducting and evaluating activities of the ROTC cadet organization, including the articulation of goals, and actuation of plans to attain them. Assessment of organizational skills and development of strategies to improve group cohesion through learning and application of Army policies and programs. M SC 401L, three physical fitness sessions per week, and weekend exercises required.

**Prerequisite:** M SC 320 or consent of instructor.

**Corequisite:** M SC 401L.

**M SC 401 L. Advanced Course Leadership Laboratories****1 Credit**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 401.

**Corequisite:** M SC 401.

**M SC 402. Transition to Lieutenant****3 Credits**

Continues methodology from M SC 401. Identification and resolution of ethical dilemmas along with counseling and motivation techniques. Examination of tradition and law as these issues relate to the Army officer and prepare the student to be a successful Army lieutenant. Leadership Lab M SC 402L, three physical fitness sessions per week and weekend exercises required.

**Prerequisite:** M SC 401 or consent of instructor.

**Corequisite:** M SC 402L.

**M SC 402 L. Transition to Lieutenant Lab****1 Credit**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution, and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 402.

**Corequisite:** M SC 402.

**M SC 425. Practicum****1-4 Credits**

Independent projects conducted under the direction of designated faculty, and concerned with analysis of selected leadership or management problems. May be repeated for a maximum of 16 credits. No S/U option.

**M SC 465. Leading Small Organization - Graduate Level****3 Credits**

Practical opportunities to lead small groups in situations of graduated complexity. Use of small unit defensive tactics and opportunities to conduct training for graduate students. Leader Lab M SC 465L, three physical fitness sessions per week and weekend exercises required. Research paper required. No S/U option.

**Prerequisite:** consent of PMS.

**Corequisite:** M SC 465L.

**M SC 465 L. Advanced Course Leadership Lab - Graduate Level****1 Credit**

Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 465.

**Prerequisite:** consent of PMS.

**Corequisite:** M SC 465.

**M SC 501. Leadership Challenges and Goal Setting****3 Credits (3+1P)**

Planning, conducting, and evaluating activities of ROTC cadet organization. Articulation of goals and plans to attain them. Assessment of organizational skills and development of strategies to improve group cohesion. Leadership lab, three physical fitness sessions per week, weekend exercise, and research paper required. Consent of instructor required.

**Prerequisite(s):** Consent of PMS.

**Corequisite(s):** M SC 401L.

**M SC 502. Transition to Lieutenant****3 Credits (3+1P)**

Continuation of M SC 501. Identification and resolution of ethical dilemmas. Counseling and motivation techniques. Examination of tradition and law for officers. Leadership lab, three physical fitness sessions per week, weekend exercises, and research paper required. Consent of instructor required.

**Prerequisite(s):** Consent of PMS.

**Corequisite(s):** M SC 402L.

# MAT-AUTOMATION & MANUFACTURING (MAT)

## **MAT 102. Print Reading for Industry** **3 Credits (2+2P)**

Reading, interpretation, and revisions of industrial technical drawings common to manufacturing, Aerospace, machine parts, electrical, hydraulic, and Pneumatic drawings. Interpretation of engineering drawings and related shop calculations. Introduction Crosslisted with: AERT 113. Restricted to: Community Colleges only.

## **MAT 105. Introduction to Manufacturing** **3 Credits**

Introduction to manufacturing evolution from basic assembly process to modern automated processes. Covers history, employability, soft skills, quality measurements, teamwork concept, production requirements, and considerations in plan layout and design. Minimum math proficiency of CCDDM 114 required or math placement into MATH 120 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 112

## **MAT 106. Applied Manufacturing Practices** **3 Credits (2+2P)**

Course will illustrate how various products are manufactured along with associated process. Mechanical behavior such as bending, cold worked, strained, work hardened, and heat transfer will be emphasized as well. In lab, students will learn how to make selected products starting from prints to complete projects including quality control. Crosslisted with: AERT 114. Restricted to: Community Colleges only.

## **MAT 107. Computer Integrated Manufacturing PLTW** **3 Credits (2+2P)**

Applies principles of robotics and automation to Computer Aided Design (CAD) design. The course builds on computer solid modeling skills developed in Introduction to Engineering Design, and Design and Drawing Production. Students use Computer Numerical Control (CNC) equipment to produce actual models of their three-dimensional designs. Fundamental concepts of robotics used in automated manufacturing, and design analysis are included. Restricted to: Community Colleges only.

## **MAT 108. Metrology, Safety and Quality Control for Manufacturing** **3 Credits (2+2P)**

Use of measuring tools in manufacturing process and quality control. These tools include: vernier and digital micrometers, calipers, height gauges, hole gauges, pin gauges, electrical pressure/flow, temperature measuring, stress/strain measurements, and non-destructive testing (eddy currents, magnetic particle, ultrasonic, bubble emission, x-ray, Gamma ray, radiography, visual inspection, ring test, taping & Zygo). Instruction to use of coordinate machine while covering the safety issues that pertains to these types of tools and equipment. Restricted to: Community Colleges only.

## **MAT 110. Machine Operation and Safety** **3 Credits (2+2P)**

Introduction to the operation and safety aspects of various types of machinery and equipment, including both mechanical and electrical machines, Rigid Tubing, and Flexible Lines. Maintenance and safety operation of industrial equipment will also be covered. Restricted to: Community Colleges only. Crosslisted with: AERT 115

## **MAT 130. Applied Industrial Electricity I** **4 Credits (3+2P)**

Electrical safety, AC and DC circuits, use and care of common measuring instrumentation, schematic and wiring diagrams, electromagnetism, National Electric Code branch circuits. Restricted to: Community Colleges only.

**Prerequisite(s):** MATH 120 or ELT 120 or OETS 118.

## **MAT 135. Applied Industrial Electricity II** **4 Credits (3+2P)**

Relationship between motor power, speed, and torque, basic application of relay circuits, motor control circuits, inductance and capacitance factors, transformers, solid state devices circuits and applications. Restricted to: Community Colleges only.

**Prerequisite(s):** MAT 130.

## **MAT 145. Electromechanical Systems for Non-Majors** **4 Credits (3+3P)**

Electromechanical system interfacing. Principles and applications of preventive and corrective maintenance procedures on automated industrial production machines using system technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams.

**Prerequisite:** consent of instructor.

## **MAT 149. Industrial Mechanical Elements** **3 Credits (2+2P)**

Introduction to mechanical systems, theory, characteristics and uses for the different types of mechanical power transmission systems used in the industry, and related industrial safety practices. Topics include: safety, drives, shafts, maintenance and lubrication. Restricted to: Community Colleges only.

## **MAT 151. Introduction to Metalworking I** **3 Credits (2+2P)**

Measuring instruments, including steel rules, combination and transfer tools, micrometers, vernier instruments, bevel instruments, and indicators. Shop safety and first aid, introduction to cutting fluids, saws and sawing, and drill presses. Restricted to: Community Colleges only.

## **MAT 205. Statistical Controls for Manufacturing Technicians** **3 Credits (2+2P)**

Use of hardware and software for quality assurance to include the design of experiments, sampling techniques, SPC, control chart application and development, and process reliability. Restricted to: Community Colleges only.

**Prerequisite(s):** ELT 120 or MATH 120.

## **MAT 221. Cooperative Experience I** **1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and rated by employer and instructor. Student meets in a weekly class. Graded S/U.

**Prerequisite:** consent of instructor.

## **MAT 234. Industrial Electricity Maintenance** **3 Credits (2+2P)**

Introduction into electrical systems, theory and uses for the different types of motors used in the industry and related industrial safety practices. DC, AC stepper and servo motors, motor speed and torque, motor performance, and efficiency, motor control fundamentals using variable frequency drives, vector controls, servo and stepper drives.

Restricted to: Community Colleges only.

**MAT 235. Programmable Logic Controllers Pneumatics****2 Credits (1+2P)**

Introduction to theory and application of pneumatic power transfer and control. Programmable logic controllers (PLC s) introduced as controlling elements for electropneumatic systems. Restricted to: Community Colleges only.

**MAT 240. Electromechanical Devices****4 Credits (2+4P)**

Theory and application of electromechanical devices and digital control circuits. Includes AD and DA converters, pneumatics, hydraulics, programmable logic controllers, DC, AC, and stepper motors, and servomechanisms. Crosslisted with: AERT 211

**Prerequisite(s):** MAT 160 and (MAT 105 or (MAT 110 & MAT 135)). Restricted to: Community Colleges only.

**MAT 245. Electromechanical Systems****3 Credits (2+2P)**

Electromechanical system interfacing. Principles and applications of preventive and corrective maintenance procedures on industrial production machines using system technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams. Crosslisted with: AERT222.

**Prerequisite(s)/Corequisite(s):** AERT 211 or MAT 240. Prerequisite(s): ELT 135 and ELT 160. Restricted to: Community Colleges only.

**MAT 265. Special Topics****1-6 Credits**

Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

## MATH-MATHEMATICS (MATH)

**MATH 101. General Supplemental Instruction I****1 Credit**

Collaborative workshop for students enrolled in Intermediate Algebra. S/U Grading (S/U, Audit).

**Corequisite(s):** MATH 120.

**MATH 102. General Supplemental Instruction II****1 Credit**

Collaborative workshop for students enrolled in College Algebra. S/U Grading (S/U, Audit).

**Corequisite(s):** MATH 121G.

**MATH 107. Topics in Mathematics****1-3 Credits**

Topics to be announced in the Schedule of Classes. Maximum of 3 credits per semester. Total credit not to exceed 6 credits. Community Colleges only.

**Prerequisite:** consent of instructor.

**MATH 111. Fundamentals of Elementary Mathematics I****3 Credits**

Numbers and the four operations of arithmetic. Understanding and comparing multiple representations of numbers and operations, in particular how these representations build from whole numbers to integers to fractions and decimals. Applying properties of numbers and operations in contextual situations. Reasoning, communicating, and problem solving with numbers and operations. Applications to ratio, and connections with algebra. Taught primarily through student activities and investigations. Restricted to: EDUC,EPAR,E ED,ECED majors.

**Prerequisite(s):** ENGL 111G and grade of C or better in MATH 120.

**MATH 112G. Fundamentals of Elementary Math II****3 Credits**

Geometry and measurement. Multiple approaches to solving problems and understanding concepts in geometry. Analyzing and constructing two- and three-dimensional shapes. Measurable attributes, including angle, length, area, and volume. Understanding and applying units and unit conversions. Transformations, congruence, and symmetry. Scale factor and similarity. Coordinate geometry and connections with algebra. Reasoning and communicating about geometric concepts. Taught primarily through student activities and investigations.

**Prerequisite(s):** C or better in MATH 111.

**MATH 120. Intermediate Algebra****3 Credits**

Linear and algebraic functions as they arise in real world problems. Exponential and logarithmic functions. Equations and inequalities and their solutions considered symbolically, graphically and numerically.

**Prerequisite:** adequate score on the Mathematics Placement Examination.

**MATH 121G. College Algebra****3 Credits**

Fundamental concepts of functions, including algebraic and graphical properties. Fitting functions to data. Finding zeroes and extreme values. Solving systems of equations.

**Prerequisites:** Adequate math placement score or C or better in MATH 120.

**MATH 142G. Calculus for the Biological and Management Sciences****3 Credits (2+2P)**

Review of functions. Derivatives, exponential and logarithmic functions, antiderivatives and indefinite integrals, basic ordinary differential equations and growth models, with an emphasis on applications. Includes a significant writing component.

**Prerequisite(s):** C or better in MATH 121G.

**MATH 190G. Trigonometry and Precalculus****4 Credits (3+2P)**

Elementary functions used in the sciences with emphasis on trigonometric functions and their inverses. Polar coordinates. Complex numbers and Euler's formula. Analytic geometry and vectors.

**Prerequisite:** adequate score on Mathematics placement exam or a C or better in MATH 121G.

**MATH 191G. Calculus and Analytic Geometry I****4 Credits**

Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule.

**Prerequisite(s):** C or better in MATH 190G.

**MATH 192G. Calculus and Analytic Geometry II****4 Credits**

Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series.

**Prerequisite(s):** C or better in MATH 191G.

**MATH 192GH. Calculus and Analytic Geometry II Honors****4 Credits (3+1P)**

A more advanced treatment of the material of MATH 192G with additional topics. Consent of Instructor required. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of Department.

**MATH 200. Directed Study****1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of the instructor.

**MATH 210G. Mathematics Appreciation****3 Credits**

Mathematics and its role in the development and maintenance of civilization.

**Prerequisites:** High school algebra, and an adequate score on the Mathematics Placement Examination.

**MATH 215. Fundamentals of Elementary Mathematics III****3 Credits**

Probability, statistics, ratios, and proportional relationships. Experimental and theoretical probability. Collecting, analyzing, and displaying data, including measurement data. Multiple approaches to solving problems involving proportional relationships, with connections to number and operation, geometry and measurement, and algebra. Understanding data in professional contexts of teaching. Taught primarily through student activities and investigations.

**Prerequisite(s):** C or better in MATH 112.

**MATH 235. Calculus for the Technical Student I****3 Credits**

Intuitive differential and integral calculus with applications to engineering.

**Prerequisite:** C or better in MATH 190G.

**MATH 236. Calculus for the Technical Student II****3 Credits**

A continuation and extension of the material in MATH 235.

**Prerequisites:** C or better in MATH 235 or in MATH 192G.

**MATH 279. Introduction to Higher Mathematics****3 Credits**

Logic; sets, relations, and functions; introduction to mathematical proofs.

**Prerequisite(s):** C- or better in MATH 192.

**MATH 280. Introduction to Linear Algebra****3 Credits**

Systems of equations, matrices, vector spaces and linear transformations. Applications to computer science.

**Prerequisite(s):** Grade of C- or better in MATH 192G.

**MATH 291G. Calculus and Analytic Geometry III****3 Credits**

Vector algebra, directional derivatives, approximation, max-min problems, multiple integrals, applications, cylindrical and spherical coordinates, change of variables.

**Prerequisite:** grade of C or better in MATH 192G.

**MATH 300. Readings****1-3 Credits**

A selection of readings and reports in the mathematical sciences, the breadth and depth of which is deemed to fit the needs of the student. Graded S/U.

**Prerequisite:** consent of instructor.

**MATH 313. Fundamentals of Algebra and Geometry I****3 Credits (3+1P)**

Covers algebra combined with geometry based on measurements of distance (metric geometry). Secondary mathematics education majors may take course as a math elective. MATH 313 does not substitute for other required math courses. Does not fulfill requirements for major in mathematics.

**Prerequisites:** MATH 111 and MATH 112G.

**MATH 316. Calculus with Hands-on Applications****3 Credits**

This course, primarily for prospective teachers, is taught in an interactive laboratory format. Students design and construct physical objects for which the planning stage requires calculus techniques. All numerical computations are carried out on graphing calculators. Meets simultaneously with MATH 516, primarily for practicing teachers. Secondary math education majors may take course as a math elective. MATH 316 does not fulfill requirements for majors in mathematics. Consent of instructor required.

**MATH 331. Introduction to Modern Algebra****3 Credits**

Elements of abstract algebra, including groups, rings and fields.

**Prerequisite:** C or better in MATH 279 and MATH 280.

**MATH 332. Introduction to Analysis****3 Credits**

Development of the real numbers, a rigorous treatment of sequences, limits, continuity, differentiation, and integration.

**Prerequisite:** C or better in MATH 192G and MATH 279.

**MATH 377. Introduction to Numerical Methods****3 Credits**

Basic numerical methods for interpolation, approximation, locating zeros of functions, integration, and solution of linear equations. Computer-oriented methods will be emphasized.

**Prerequisites:** grade of C or better in MATH 192G and some programming experience.

**MATH 391. Vector Analysis****3 Credits**

Calculus of vector valued functions, Green's and Stokes' theorems and applications.

**Prerequisite:** grade of C or better in MATH 291G.

**MATH 392. Introduction to Ordinary Differential Equations****3 Credits**

Introduction to differential equations and dynamical systems with emphasis on modeling and applications. Basic analytic, qualitative and numerical methods. Equilibria and bifurcations. Linear systems with matrix methods, real and complex solutions.

**Prerequisite:** C or better in MATH 192G or B or better in MATH 236.

**MATH 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of faculty member.

**MATH 401. Special Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be used to fulfill a course requirement for the mathematics major. May be repeated up to 12 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**MATH 411V. Great Theorems: The Art of Mathematics****3 Credits**

Adopts the view of mathematics as art, using original sources displaying the creation of mathematical masterpieces from antiquity to the modern era. Original sources are supplemented by cultural, biographical, and mathematical history placing mathematics in a broad human context.

**Prerequisites:** Grades of B or better in MATH 192G and any upper division MATH/STAT course, with overall GPA of 3.2 or better, or consent of instructor.

**MATH 421. Financial Mathematics I****3 Credits**

Types of derivatives, forwards and futures, options, returns and payoffs, Arrow-Debre, complete and incomplete markets, the one period model, the binomial option pricing model, binomial trees, martingales and sub martingales, Brownian motion, stochastic integrals, the Ito integral, Ito's dilemma, the Black-Scholes model, the Black-Scholes formula, European options, American options, free boundary problems, variational inequalities. This course is offered simultaneously with MATH 521.

**Prerequisite(s):** C or better in STAT 371 and either MATH 280 or MATH 480 or consent of instructor.

**MATH 422. Financial Mathematics II****3 Credits**

Bonds, swaps, exotic options, barrier options, Asian options, look back options, options with transaction costs, Fokker Plank theory, computing expectations, the Heath-Jarrow- Morton theorem, the Ho-Lee model, stochastic volatility models, exponential-affine models, numerical methods. This course is offered simultaneously with MATH 522.

**Prerequisite:** C or better in MATH 421 or consent of instructor

**MATH 423. Numerical Optimization and Applications to Financial Mathematics****3 Credits**

Dynamic optimization of a monopolist, trading off inflation and unemployment, the optimal adjustment of labor demand, infinite planning horizon, the optimal investment path of a firm, the optimal social saving behavior, phase-diagram analysis, optimal control theory, the political business cycle, the dynamics of a revenue-maximizing firm, economic examples of state-space constraints. This course is offered simultaneously with MATH 523.

**Prerequisite(s):** C- or better in MATH 421.

**MATH 451. Introduction to Differential Geometry****3 Credits**

Applies calculus to curves and surfaces in three dimensional Euclidean space.

**Prerequisite(s):** C- or better in each of MATH 280 and MATH 391, or consent of instructor.

**MATH 452. Foundations of Geometry****3 Credits**

Topics in projective, axiomatic Euclidean or non-Euclidean geometries. Restricted to: Main campus only.

**Prerequisite(s):** C or better in MATH 331 or MATH 332.

**MATH 453. Introduction to Topology****3 Credits**

Introduction to topological spaces and metric spaces, with connections to analysis, geometry, and the classification of surfaces.

**Prerequisite(s):** C- or better in MATH 332 or consent of instructor.

**MATH 454. Mathematical Logic****3 Credits**

Propositional calculus and the first order predicate calculus, including Godel's completeness theorem for the latter, and additional topics at the option of the instructor.

**Prerequisite(s):** C or better in MATH 331 or MATH 332, or consent of instructor.

**MATH 455. Elementary Number Theory****3 Credits**

Covers primes, congruences and related topics.

**Prerequisite:** grade of C or better in MATH 331 or consent of instructor.

**MATH 457. Applications of Modern Algebra****3 Credits**

Topics may include coding theory, cryptography, graph theory, or symmetry groups. May be repeated up to 9 credits.

**Prerequisite(s):** C or better in MATH 331 or consent of instructor.

**MATH 459. Survey of Geometry****3 Credits**

Basic concepts of Euclidean geometry, ruler and compass constructions. May include topics in non-Euclidean geometry. For non-math majors.

Restricted to: Main campus only.

**Prerequisite(s):** C or better in MATH 331 or MATH 332.

**MATH 466. Lattice Theory****3 Credits**

Introduction to partially ordered sets, distributive, modular, and Boolean lattices.

**Prerequisite(s):** C- or better in MATH 330 or C- or better in MATH 331 or C- or better in MATH 332 or consent of instructor.

**MATH 471. Complex Variables****3 Credits**

A first course in complex function theory, with emphasis on applications.

**Prerequisite(s):** C- or better in MATH 391 or C- or better in both MATH 392 and MATH 291.

**MATH 472. Fourier Series and Boundary Value Problems****3 Credits**

Fourier series and methods of solution of the boundary value problems of applied mathematics.

**Prerequisite(s):** C- or better in MATH 392.

**MATH 473. Calculus of Variations and Optimal Control****3 Credits**

Euler's equations, conditions for extrema, direct methods, dynamic programming, and the Pontryagin maximal principle.

**Prerequisite(s):** C- or better in MATH 392.

**MATH 480. Matrix Theory and Applied Linear Algebra****3 Credits**

An application driven course, whose topics include rectangular systems, matrix algebra, vector spaces and linear transformations, inner products, and eigenvalues and eigenvectors. Applications may include LU factorization, least squares, data compression, QR factorization, singular value decomposition, and search engines.

**Prerequisite(s):** C or better in any 300-level course with a MATH or STAT prefix.

**MATH 481. Advanced Linear Algebra****3 Credits**

Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics.

**Prerequisite:** grade of C or better in MATH 331.

**MATH 491. Introduction to Real Analysis I****3 Credits**

Rigorous discussion of the topics introduced in calculus. Sequences, series, limits, continuity, differentiation.

**Prerequisite:** grade of C or better in MATH 332 or consent of instructor.

**MATH 492. Introduction to Real Analysis II****3 Credits**

Continuation of MATH 491. Integration, metric spaces and selected topics.

**Prerequisite(s):** C- or better in MATH 491 or consent of instructor.

**MATH 498. Directed Reading****1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**MATH 501. Introduction to Differential Geometry****3 Credits**

Same as MATH 451 with additional work for graduate students.

**MATH 502. Foundations of Geometry****3 Credits**

Same as MATH 452 with additional assignments for graduate students.

**MATH 503. Introduction to Topology****3 Credits**

Same as MATH 453 with additional work for graduate students.

**MATH 504. Mathematical Logic****3 Credits**

Same as MATH 454 with additional assignments for graduate students.

**MATH 505. Elementary Number Theory****3 Credits**

Same as MATH 455 with additional assignments for graduate students.

**MATH 506. Lattice Theory****3 Credits**

Same as MATH 466 with additional assignments for graduate students.

**MATH 507. Applications of Modern Algebra****3 Credits**

Taught with MATH 457 with additional work for graduate students. May be repeated up to 9 credits.

**MATH 509. Information Theory****3 Credits**

This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Restricted to: Main campus only. Crosslisted with: E E 586

**Prerequisite(s):** E E 571 or STAT 515.

**MATH 511. Fundamentals of Elementary Mathematics I****3 Credits (3+1P)**

Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 111 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

**MATH 512. Fundamentals of Elementary Mathematics II****3 Credits (3+1P)**

Real numbers, geometry, and statistics, incorporating calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 112 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

**MATH 513. Fundamentals of Algebra and Geometry I****3 Credits (3+1P)**

Algebra and metric geometry, incorporating appropriate calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 313 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

**MATH 516. Calculus with Hands-on Application****3 Credits**

This course, primarily for in-service teachers, is taught in an interactive laboratory format. Students design and construct physical objects for which the planning stage requires calculus techniques. All numerical computations are carried out on graphing calculators. Meets simultaneously with Math 316, primarily for prospective teachers. Does not fulfill degree requirements for M.S. in Mathematics.

**Prerequisite(s):** MATH 511 and MATH 512 or consent of instructor.

**MATH 517. Complex Variables****3 Credits**

Same as MATH 471 with additional work for graduate students.

**MATH 518. Fourier Series and Boundary Value Problems****3 Credits**

Same as MATH 472 with additional work for graduate students.

**MATH 519. Calculus of Variations and Optimal Control****3 Credits**

Same as MATH 473 with additional work for graduate students.

**MATH 521. Financial Mathematics I: Portfolio Optimization****3 Credits**

Complete and incomplete markets, optimal investment paths, dynamic optimization, the Black-Scholes model, European options, American options. May be repeated up to 3 credits.

**Prerequisite(s):** STAT 515.

**MATH 522. Financial Mathematics II****3 Credits**

Bonds, Swaps, Exotic options, Barrier options, Asian options, Lookback options, options with transaction costs, Fokker Plank theory: computing expectations, The Heath-Jarrow-Morton theorem, the Ho-Lee model, Stochastic volatility models, Exponential-Affine models, numerical methods.

**Prerequisite:** MATH 521.

**MATH 523. Numerical Optimization and Applications to Financial Mathematics****3 Credits**

Dynamic optimization of a monopolist, trading off inflation and unemployment, the optimal adjustment of labor demand, infinite planning horizon, the optimal investment path of a firm, the optimal social saving behavior, phase-diagram analysis, optimal control theory, the political business cycle, the dynamics of a revenue-maximizing firm, economic examples of state-space constraints. This course is offered simultaneously with MATH 423.

**Prerequisite:** MATH 521.

**MATH 525. Advanced Linear Algebra****3 Credits**

Same as MATH 481 with additional work for graduate students. May be repeated up to 3 credits.

**MATH 527. Introduction to Real Analysis I****3 Credits**

Same as MATH 491 with additional work for graduate students.

**MATH 528. Introduction to Real Analysis II****3 Credits**

Same as MATH 492 with additional work for graduate students.

**MATH 530. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.

**MATH 531. Ordinary Differential Equations****3 Credits**

Linear algebra and linear ordinary differential equations, existence and uniqueness of solution, smooth dependence on initial conditions, flows, introduction to smooth dynamical systems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 527, or consent of instructor.

**MATH 532. Partial Differential Equations****3 Credits**

The basic equations of mathematical physics. Elliptic, hyperbolic, and parabolic equations. Characteristic surfaces. Well-posed problems. May be repeated up to 3 credits.

**Prerequisite(s):** MATH 527 or consent of instructor.

**MATH 540. Directed Reading****1-6 Credits**

May be repeated for a maximum of 6 credits. Consent of instructor required. Graded: S/U.

**MATH 541. Topology I****3 Credits**

Connectedness and compactness of topological spaces, introduction to the quotient topology, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem

**Prerequisite(s):** MATH 525 and MATH 528, or consent of instructor.

**MATH 542. Topology II****3 Credits**

Covering spaces and their classification, singular homology, degree theory, Brouwer's fixed point theorem, CW-complexes and cellular homology, and other applications.

**Prerequisite(s):** MATH 541 or consent of instructor.

**MATH 555. Differentiable Manifolds****3 Credits**

Differentiable structures, tangent bundles, vector fields and differential equations. Additional topics may include differential forms, De Rham cohomology, Riemannian geometry, and topics chosen by the instructor. May be repeated for a maximum of 9 credits. Consent of instructor required.

**Prerequisite(s):** MATH 525 and MATH 528, or consent of instructor.

**MATH 557. Axiomatic Set Theory****3 Credits**

A detailed study of Zermelo-Fraenkel and Bernays set theories.

**Prerequisite:** MATH 504 or equivalent.

**MATH 562. History and Theories of Mathematics Education****3 Credits**

A study of the history of the mathematics taught in American schools, including an examination of authentic original textbooks and the changes in their content and the approach to the subject over time, together with writings of people who have influenced the development and changes of mathematics education. Theories of learning mathematics, and current issues in mathematics education.

**Prerequisite(s):** Restricted to graduate students.

**MATH 563. Algebra with Connections****3 Credits**

Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 564. From Number to Algebra****3 Credits**

The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 566. Data Analysis with Applications****3 Credits**

Statistical concepts and terminology in professional uses of data by teachers, such as standardized test score reports and educational research; visual displays of data; measures of variation and central tendency; consideration of how K-12 topics in Data Analysis are developed from one grade level to the next. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 567. From Measurement to Geometry****3 Credits**

The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 568. Using Number Throughout the Curriculum****3 Credits**

Understand number concepts more deeply by seeing many examples of those concepts applied in other content strands. Develop mathematical knowledge and understanding to build a repertoire of ways for students to practice and review basic number skills and concepts as part of later, more advanced courses. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 569. Geometry with Connections****3 Credits**

Connections between Geometry and other K-12 curriculum strands, especially Algebra and Probability / Data Analysis. Address key attributes of geometric concepts by considering their connections within and across grade levels. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

**Prerequisite(s):** Admittance into the MC2-LIFT program.

**MATH 581. Algebra I****3 Credits**

Examines groups, commutative rings, solvability of polynomials, Galois theory, ruler and compass constructions.

**Prerequisite/corequisite:** MATH 525.

**MATH 582. Algebra II****3 Credits**

Group actions, fundamental theorem of finite Abelian groups, Sylow theorems, solvable groups, noncommutative rings, Noetherian rings, unique factorization domains, modules, tensor products.

**Prerequisite:** MATH 581.

**MATH 583. Introduction to Commutative Algebra and Algebraic Geometry**  
**3 Credits**

Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases. May be repeated up to 9 credits.  
**Prerequisite(s):** MATH 581 or consent of instructor.

**MATH 584. Representation Theory**  
**3 Credits**

Topics from representation theory of finite or infinite groups. May be repeated for a maximum of 9 credits.  
**Prerequisite:** consent of instructor.

**MATH 585. Universal Algebra**  
**3 Credits**

Universal algebra and category theory. Theorems of Birkhoff and Tarski relating equational classes, free algebras and their construction through homomorphisms, subalgebras and products. Topics from model theory, sheaf theory and representation by subdirect products. May be repeated for a maximum of 6 credits.  
**Prerequisite:** consent of instructor.

**MATH 586. Nonlinear Dynamics I**  
**3 Credits**

Introduction to nonlinear dynamics and deterministic chaos. Core topics include stability and bifurcations; chaos in one dimensional maps; universality and re-normalization group. Further topics include symbolic dynamics, fractals, sensitive dependence on initial data, self-organization and complexity and cellular automata. Knowledge of differential equations and linear algebra is desired. May be repeated up to 6 credits.

**MATH 591. Complex Analysis I**  
**3 Credits**

Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations. May be repeated up to 3 credits.  
**Prerequisite(s):** MATH 528, or consent of instructor.

**MATH 593. Measure and Integration**  
**3 Credits**

Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.  
**Prerequisite:** MATH 528 or consent of instructor.

**MATH 594. Real Analysis**  
**3 Credits**

Differentiation,  $L_p$  spaces, Banach spaces, measure and topology, other selected topics.  
**Prerequisite:** MATH 593.

**MATH 599. Master's Thesis**  
**15 Credits**

Thesis.

**MATH 600. Doctoral Research**  
**1-15 Credits**

Research.

**MATH 643. Topology III**  
**3 Credits**

Topics may include higher homotopy groups, fibrations, cohomology operations and obstruction theory, spectral sequences, or others chosen by instructor. May be repeated for a maximum of 9 credits.  
**Prerequisites:** MATH 542 or consent of instructor.

**MATH 683. Homological Algebra**  
**3 Credits**

Basic topics in homological algebra and category theory. May be repeated for a maximum of 9 credits.  
**Prerequisite:** MATH 542 or MATH 582 or consent of instructor.

**MATH 695. Introduction to Functional Analysis I**  
**3 Credits**

Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem. May be repeated up to 3 credits.  
**Prerequisite(s):** MATH 594, or consent of instructor.

**MATH 698. Selected Topics**  
**1-15 Credits**

Selected topics.

**MATH 700. Doctoral Dissertation**  
**1-15 Credits**

Dissertation.

## MGT-MANAGEMENT (MGT)

**MGT 201. Introduction to Management**  
**3 Credits**

Covers the functioning and administration of different types of complex organizations. Concepts and theories of management and organizational behavior.

**MGT 309. Human Behavior in Organizations**  
**3 Credits**

Interpersonal and organizational behavior, motivation, communication, team building, leadership, diversity management, legal and ethical issues, and politics in organizations. Credit may not be earned for both MGT 309 and MGT 315V.

**MGT 310V. Entrepreneurial Mindset**  
**3 Credits**

This course provides the opportunity to learn to think like an entrepreneur in the broader context of social entrepreneurship, intrapreneurship, creative problem solving, opportunity recognition, and innovation.

**MGT 315V. Human Relations in Organizations**  
**3 Credits**

Interactions among people and groups in societies where organizations abound. Focus on the behavior of people in organizational situations and approaches for understanding that behavior. Explores motivation, communication, leadership and team processes. Restricted to nonbusiness majors. Credit may not be earned for both MGT 309 and MGT 315V.

**MGT 332. Human Resources Management**  
**3 Credits**

Survey course in human resources management. Includes recruitment, selection, equal employment opportunity, performance appraisal, training, compensation, safety, and union-management relations.

**MGT 333. Training and Development****3 Credits**

Training and development of human resources, including training needs assessment, training approaches and techniques, and evaluation of training effectiveness.

**MGT 335V. Business and Government****3 Credits**

Crosslisted with: ECON 335G

**MGT 344. Production and Operations Management****3 Credits**

Management of physical and human resources; management information systems in operations; applications in various organizations.

**Prerequisite:** STAT 251G or A ST 251G or A ST 311; and BCIS 338 or BCIS 350.

**MGT 345V. Quality and Competitiveness: An International Perspective****3 Credits**

Quality management and competitiveness are studied in manufacturing, services, and the public sector with an international perspective.

Topics include: global history of quality, foreign competition and its impact on quality and productivity, quality management and continuous improvement, international operations management, quality assessment, and a review of the emergence of quality and competitiveness in government, education and health care.

**MGT 347. Management Functions and Processes****3 Credits**

Planning, organizing, directing, and controlling operating units in an organization. Applications to a variety of types of organizations.

**MGT 351. Supply Chain Management****3 Credits**

Acquisition and control and delivery of materials, parts, equipment, and services for end use in the organization. Applications to service and manufacturing industries, nonprofit, and governmental institutions.

**MGT 360V. Negotiation and Business Conflict Resolution: Theory and Practice****3 Credits**

Covers the basics of negotiation theory and practice including the use of quantitative methods and their realistic application in resolving disputes. Application of conflict resolution skills.

**MGT 361. Small Business Management****3 Credits**

Principles and practice of managing a small enterprise with emphasis on growth and performance.

**MGT 375V. Global Environmental Assessment and Management****3 Credits**

Examines the principles of environmental assessment and management. Topics include global environmental concerns, industrial environmental management, life cycle assessment, system analysis, process improvement, and sustainable development, among others.

**MGT 388V. Leadership and Society****3 Credits**

Exploration of the multifaceted nature of leadership in modern society through readings and seminar discussion.

**MGT 391. Management Internship and Cooperative Education I****1-3 Credits**

Application of management skills to the work environment. Open only to students majoring or minoring in management. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

**Prerequisites:** MGT 309 and consent of instructor.

**MGT 448. Small Business Consulting****3 Credits**

Study analysis and presentation of recommendations for solving significant problems confronting small businesses.

**Prerequisite(s):** Senior standing or consent of instructor.

**MGT 449. Strategic Management****3 Credits**

Integrative approach to envisioning the future and shaping strategies for business success.

**Prerequisite(s):** BCIS 338 or 350; BLAW 316; FIN 341; MGT 309; MKTG 303; and one of the following: MGT 344 or MGT 470 or BCIS 485.

**MGT 451. Selection, Placement, and Performance Evaluation****3 Credits**

Staffing processes for organizations and the evaluation of employee performance. Use of selection methods and measurement of work behavior.

**MGT 453. Leadership and Motivation****3 Credits**

Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Crosslisted with: I E 453

**MGT 454. Work Teams in Organizations****3 Credits**

Theories of small groups and their application to the work situation. Why and how groups form, grow, communicate, and maintain themselves.

**Prerequisites:** senior or above standing.

**MGT 458. Comparative International Management****3 Credits**

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as I B 458.

**MGT 460. Compensation Management****3 Credits**

An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration.

**Prerequisite(s):** MGT 332 or consent of instructor.

**MGT 461. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MKTG 461.

**Prerequisite(s):** Senior standing or consent of instructor.

**MGT 465. Contemporary Issues in Human Resources Management****3 Credits**

Integrative course in human resources management, emphasizing the application of advanced concepts to complex personnel cases.

**Prerequisite:** MGT 332.

**MGT 466. Managing Electronic Commerce: A Business Models****Perspective****3 Credits**

Surveys the emerging Internet technology involving business to business, business to consumer, and consumer to consumer forms of trade. Covers quantitative decision and negotiation analysis techniques as well as auction and market trade mechanisms.

**MGT 470. Project Management in Organizations****3 Credits**

Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.

**MGT 490. Selected Topics****1-18 Credits (1-18)**

Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.

**MGT 491. Management Internship and Cooperative Education II****1-3 Credits**

Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

**Prerequisite:** MGT 309 and consent of instructor.

**MGT 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisites:** junior or above standing and consent of instructor.

**MGT 502. Operations Management****3 Credits**

Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources.

**Prerequisite(s):** Graduate students only.

**MGT 503. Organizational Behavior and Management Processes****3 Credits**

Covers the theory and practice related to the successful management of human resources in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory.

**Prerequisite:** graduate students only.

**MGT 512. Quantitative Analysis for Business Decisions****3 Credits**

Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making.

**Prerequisite:** graduate students only.

**MGT 527. Negotiation and Business Dispute Resolution****3 Credits**

Same as BLAW 527.

**MGT 548. Small Business Consulting****3 Credits**

Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGT 448 with differentiated assignments for graduate students.

**Prerequisite(s):** Graduate standing.

**MGT 590. Strategic Management****3 Credits**

Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Restricted to majors.

**Prerequisite:** M.B.A. student in his or her final semester.

**MGT 591. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.

**Prerequisite(s):** Graduate standing.

**MGT 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 6 credits may be earned.

**Prerequisite:** consent of instructor.

**MGT 600. Doctoral Research****1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to management majors.

**MGT 601. Research in Management****1 Credit**

Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.

**MGT 640. Instructional Development for Teaching Business****3 Credits**

Pedagogical issues and techniques in collegiate business education. Includes course and curriculum development, outcomes assessment, class management, and teaching techniques. Practical issues faced in college instruction. Restricted to doctoral students.

**MGT 645. Seminar in Human Resources Management****3 Credits**

Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students.

**MGT 650. Seminar in Organizational Behavior****3 Credits**

Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students.

**MGT 655. Seminar in Organizational Systems and Theory****3 Credits**

Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students.

**MGT 660. Research Design and Methodology****3 Credits**

Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students.

**MGT 661. Qualitative Research Methods****3 Credits**

In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action research, and ethnomethodology. Restricted to doctoral students.

**MGT 670. Seminar in Operations Management****3 Credits**

Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology.

**Prerequisite(s):** Restricted to Doctoral students.

**MGT 675. Seminar in Strategic Management****3 Credits**

Survey of current and classical readings in strategy. Introduces the doctoral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students.

**MGT 685. Story Consulting to Organizations****3 Credits**

Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact) intervention with a local consenting organization. Restricted to doctoral students.

**MGT 690. Special Topics****3 Credits**

Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students.

**Prerequisite(s):** Vary according to seminar being offered.

**MGT 698. Special Topics****1-3 Credits**

**Prerequisite:** consent of instructor.

**MGT 700. Doctoral Dissertation****15 Credits**

**Prerequisite:** advancement to candidacy.

**MKTG-MARKETING (MKTG)****MKTG 180. PGA Golf Management Freshman Orientation****3 Credits**

Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America Students will also be introduced to the Qualifying Level of the PGA's Educational Program, Rules of Golf, PGA Constitution and the History of the PAG. Additional course fee required. Consent of Instructor required. Restricted to: PGA Golf Management Students. MKTG/PGM majors.

**MKTG 181. Level 1, PGA's PGM Education Program (Part 1)****3 Credits**

Introduction of Level 1 of the PGA's Educational Program. This class will focus on Business Planning and Operations, Customer Relations, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 203. Introduction to Marketing****3 Credits**

Covers processes, functions and principles in the current marketing system. Includes role of marketing in the economy, types of markets, product development, distribution channels, pricing and promotion strategies, market research and management of the processes. Community Colleges only.

**MKTG 280. Level 1, PGA's PGM Education Program (Part 2)****3 Credits**

Continuation of Level 1 of the PGA's PGM Education Program. This class will focus on Tournament Operations, Golf Car Fleet Management and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 281. Level 1, PGA's PGM Education Program (Part 3)****1.5 Credits**

Completion of Level 1 of the PGA's PGM Education Program. This class will focus on Introduction to Teaching and Golf Club Performance and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 303. Principles of Marketing****3 Credits**

Process, functions, and principles in the current marketing system.

**MKTG 305. Marketing Food and Agricultural Products****3 Credits**

Same as AG E 305. Crosslisted with: AG E 305.

**MKTG 310. Marketing Research****3 Credits**

Design, collection analysis, and presentation of research data.

**Prerequisites:** A ST/STAT 251G or consent of instructor.

**MKTG 311V. Consumer Behavior****3 Credits**

The different aspects of consumer behavior and the variables affecting consumer decisions. Analysis of current concepts and models.

**MKTG 312. Personal Selling****3 Credits**

Implementation of the promotion process through interpersonal communications between salesperson and prospects. Serving customers by sales representatives.

**MKTG 313. Retail Management****3 Credits**

Investigates retail business operations and focuses on the strategic profit model, store location, layout, display, merchandising, operations, and personnel.

**MKTG 314. Advertising Strategy****3 Credits**

Utilization of advertising as a business administration function; communication with consumers as a means of attaining marketing goals.

**MKTG 317. International Marketing****3 Credits**

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as I B 317.

**MKTG 324. Product/Service Development****3 Credits**

Covers product innovation, development, commercialization and resource recovery, price determination and administration strategies, and complementing planning processes.

**MKTG 354. Sports Marketing****3 Credits**

The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.

**MKTG 357. Internet and Social Media Marketing****3 Credits**

Focuses on the consumer psychology and marketing strategies at work in advertising and selling brands via the Internet and social media networks.

**MKTG 380. Level 2, PGA's PGM Education Program (Part 1)****1.5 Credits**

Introduction to Level 2 of the PGA's PGM Education Program. This class will focus on Merchandising and Inventory Management, Golf Operations and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 381. Level 2, PGA's PGM Education Program (Part 2)****1.5 Credits**

Completion of Level 2 of the PGA's PGM Education Program. This class will focus on Turfgrass Management, Intermediate Teaching and Golf Club Alteration and corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 400. Marketing Internship/Field Experience****3 Credits**

Internship of field experience in application of marketing principles. The student must accept an internship before being allowed to enroll in the course. Consent of instructor required. Restricted to MKTG majors.

**MKTG 414. Athletics Business Administration****3 Credits**

This course examines the marketing and operations of sports programs with emphasis on Division I Collegiate Programs. Topics include event management, ticketing, marketing, trademark and licensing, NCAA compliance, development, finance, contracts, facility maintenance, television, and the roles and responsibilities of the coaches.

**MKTG 449. Promotion Management****3 Credits**

Covers concepts and problems in the use of advertising, internet marketing, social media marketing, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.

**MKTG 451. Food and Agribusiness Market Assessment and Research****3 Credits**

Same as AG E 451. Consent of Instructor required. Crosslisted with: AG E 451.

**MKTG 453. Sales Management****3 Credits**

The nature of the sales management function in industry. Focuses on intra and interdepartmental sales management activities.

**Prerequisite(s):** MKTG 312.

**MKTG 461. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MGT 461.

**Prerequisite(s):** Senior standing or consent of instructor.

**MKTG 462. Advanced Sales****3 Credits**

Advanced instruction and skill development in interpersonal communication skills to broaden understanding of the professional sales role (especially in team selling situation), career management, personal productivity, negotiation, and coordination with other functional areas. May be repeated up to 3 credits.

**Prerequisite(s):** MKTG 312.

**MKTG 480. Level 3, PGA's PGM Education Program (Part 1)****1.5 Credits**

Introduction to Level 3 of the PGA's PGM Education Program. This class will focus on Human Resource Management/Supervising and Delegating, Food and Beverage and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 481. Level 2, PGA's PGM Education Program (Part 2)/ Final Experience****3 Credits**

Completion of Level 3 of the PGA's PGM Education Program. This Class will focus on Advanced Teaching and Club fitting, Player Development/Teaching Business. The Final Experience and the corresponding PGA Work Experience Activities. Please note that the following are requirements for successful completion of this senior level PGA Golf Management capstone course: 16 months of internship, completion of the Qualifying Level, Level 1, Level 2, and Level 3 of the PGA's PGM Education Program and successful completion of the PGA's Playing Ability Test. Consent of Instructor required. Restricted to: MKTG/PGM majors.

**MKTG 489. Strategy and Policy****3 Credits**

Techniques and analysis of marketing strategy and policy planning and formulation.

**Prerequisites:** senior standing or consent of instructor.

**MKTG 490. Selected Topics****1-18 Credits (1-18)**

Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.

**MKTG 498. Independent Study****1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

**Prerequisites:** junior or above standing and consent of instructor.

**MKTG 500. Concepts in Marketing****1 Credit**

An overview of fundamental principles of Marketing necessary for prospective MBA students who do not have an undergraduate background in Marketing. Includes: Terminology, basic functions and responsibilities associated with practice of marketing.

**Prerequisite(s):** Admitted to MBA program or consent of course department.

**MKTG 503. Marketing Management****3 Credits**

Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions. Graduate students only.

**Prerequisite(s):** MKTG 303 or equivalent with a grade of B or better.

**MKTG 591. Seminar in Entrepreneurship****3 Credits**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGT 591.

**Prerequisite(s):** Graduate standing.

**MKTG 601. Marketing Management****3 Credits**

Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.

**MKTG 610. Marketing and the Scientific Method****3 Credits**

Issues related to the evolution of research philosophies and methodologies. Critical to the development of appreciation for the value of research and experimentation.

**MKTG 620. Research- Theory Interface****3 Credits**

Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required.

**MKTG 625. Consumer Behavior****3 Credits**

Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary issues relevant to the study of marketing.

**MKTG 640. Measurement and Structural Equation Modeling****3 Credits**

Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. May be repeated up to 3 credits.

**Prerequisite(s):** A ST 505.

**MKTG 670. Marketing Theory****3 Credits**

The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing.

**MKTG 690. Special Topics in Marketing****3 Credits**

A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.

**MKTG 698. Selected Topics****1-9 Credits (1-9)**

Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.

**MKTG 700. Doctoral Dissertation****15 Credits**

**Prerequisite:** advancement to candidacy.

**MOLB-MOLECULAR BIOLOGY (MOLB)****MOLB 448. Special Research Problems****1-3 Credits**

Individual investigation, theoretical or experimental, under the supervision of a molecular biology faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**MOLB 520. Molecular Cell Biology****3 Credits**

Same as BIOL 520.

**MOLB 542. Biochemistry I****3 Credits**

Same as BCHE 542. B or better required.

**MOLB 545. Molecular and Biochemical Genetics****3 Credits**

Same as BCHE 545 and BIOL 545.

**MOLB 546. Biochemistry II****3 Credits**

Same as BCHE 546.

**MOLB 590. Discussions in Molecular Biology****1 Credit**

Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and three times for doctoral students. Graded by 2 options: S/U or Letter Grade

**MOLB 597. Laboratory Rotations/Research Discussions****1-3 Credits**

All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.

**MOLB 598. Special Research Programs****1-3 Credits**

Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.

**MOLB 599. Master's Thesis****1-15 Credits (1-15)**

Experimental and scholarly research leading to the preparation of a master's thesis.

**MOLB 600. Molecular Biology Research****1-15 Credits**

Laboratory research efforts prior to successful completion of doctoral comprehensive exam.

**MOLB 650. Advanced Topics in Molecular Biology****1-3 Credits**

Discussions and lectures on topics of current interest in molecular biology for doctoral students.

**MOLB 698. Advanced Research Projects****1-9 Credits**

Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.

**MOLB 700. Doctoral Dissertation Research****15 Credits**

Research for doctoral students after completing comprehensive exams.

# MPH-MASTER OF PUBLIC HEALTH (MPH)

**MPH 500. Orientation to Public Health****3 Credits**

Introduction to the historical and contemporary perspectives of public health theory and practice. Includes an investigation of public health as a discipline, a profession, and the programmatic attempts to improve health status.

**MPH 510. Community and Psychosocial Aspects of Public Health****3 Credits**

Social, behavioral, and educational aspects of disease prevention and health promotion programs. Restricted to MPH majors.

**MPH 515. Introduction to Gerontology****3 Credits**

Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population.

**MPH 520. Biostatistical Applications in Public Health****3 Credits**

Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors.

**MPH 530. Epidemiological Approaches to Disease Control and Prevention****3 Credits**

Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors.

**MPH 540. Health Services System: Administration and Organization****3 Credits**

This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health services organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 541. Principles of Health Program Management****3 Credits**

This course prepares the student to assume a supervisory role in the management of health and human services programs. The course will cover essential management functions such as leadership, organizational assessment, planning, decision-making, organizational structure, budgeting, marketing, and human resource management. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 545. Health Services Organization and Delivery****3 Credits**

This course includes the framework of the United States healthcare system; organization and administration of health services; alternate ways of organizing and financing health systems; the roles of the government and free market on health care services; and the barriers to health services delivery. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 546. Public Health Finance and Budget Management****3 Credits**

Introduces health care accounting and finance to non-financial students. Students are exposed to the financial structure of health care organizations and the environment within which they operate. Instruction also introduces the use of accounting and financial information in investor-owned and not-for-profit organizations in the health care industry. Topics include understanding the creation and interpretation of financial statements, financial accounting and reporting requirements, financial analysis, budgeting, and resource allocation. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 547. Public Health Law and Ethics****3 Credits**

This course examines major legal and ethical concepts and their impact on public health policy and practice. The course examines governmental authority, at various jurisdictional levels, to improve public health. This course will focus on public health law in the United States. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 550. Environmental Public Health Issues****3 Credits**

Environmental health issues from a public health perspective. Restricted to MPH majors.

**MPH 557. Health Promotion for the Older Adult****3 Credits**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings.

**MPH 558. Public Health Policy Analysis****3 Credits**

Covers issues related to U.S.-health policy and allocation of resources. Examination of local, state, and federal public health and health care funding. Assessment of impact of health policy on health education, medical practice, and the workplace. May be repeated up to 3 credits. Restricted to: MPH majors.

**MPH 559. Infectious and Noninfectious Disease Prevention****3 Credits**

History, etiology, and prevention of diseases affecting humans. Consent of Instructor required. Crosslisted with: PHLS 459.

**MPH 560. American Indian Health****3 Credits**

Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits. Crosslisted with: PHLS 460.

**MPH 561. Health Disparities: Determinants and Interventions****3 Credits**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. May be repeated up to 3 credits. Crosslisted with: PHLS 461.

**MPH 562. Hispanic Health Issues****3 Credits**

Cultural differences that aid or hinder communication with Hispanic clients and the application of cross-cultural communication skills. Some field trips may be required. May be repeated up to 3 credits. Crosslisted with: PHLS 462.

**MPH 564. Cross-Cultural Aspects of Health****3 Credits**

An examination of health practices from a variety of cultural perspectives; communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits. Crosslisted with: PHLS 464V.

**MPH 565. International Health Problems****3 Credits**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. May be repeated up to 3 credits. Crosslisted with: PHLS 465.

**MPH 566. International Health Practicum****1-3 Credits**

Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits. Crosslisted with: PHLS 466.

**MPH 567. Rural Health Issues****3 Credits**

Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Crosslisted with: PHLS 467.

**MPH 568. Coping with Loss and Grief: A Cross-Cultural Perspective****3 Credits**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. May be repeated up to 3 credits. Crosslisted with: PHLS 468.

**MPH 569. U.S.-Mexico Border Health Issues****3 Credits**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. May be repeated up to 3 credits. Crosslisted with: PHLS 469.

**MPH 570. Foundations of Public Health Education****3 Credits**

Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education.

**MPH 571. Health Informatics****3 Credits**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. May be repeated up to 3 credits. Crosslisted with: PHLS 471.

**MPH 572. Techniques of Health Communication/Education****3 Credits**

Application of a wide range of communication and education theories/methods, including program planning and evaluation, in public health programming. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 573. Community Organization in Public Health****3 Credits**

Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 574. Health Program Planning****3 Credits**

Covers process of successful public health education program planning and grant writing. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 575. Methods of Community Health Education****3 Credits**

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Crosslisted with: PHLS 475.

**Prerequisite(s):** MPH 510.

**MPH 576. Theoretically-Based Interventions****3 Credits**

Identifying and developing interventions to problematic health-related behaviors. May be repeated up to 3 credits. Crosslisted with: PHLS 476. Restricted to: MPH majors.

**Prerequisite(s):** MPH 510.

**MPH 578. Evaluative Approaches in Public Health****3 Credits**

Survey and analyses of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques. Restricted to: MPH majors.

**Prerequisite(s):** MPH 520.

**MPH 579. Research and Resources in Community Health****3 Credits**

Exploration of available public health research studies, data, results and implications. Restricted to MPH majors.

**Prerequisite(s):** MPH 520.

**MPH 581. Public Health Preparedness and Response****3 Credits**

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits. Crosslisted with: PHLS 481.

**MPH 586. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits. Restricted to: MPH majors.

**MPH 590. Independent Study****1-6 Credits**

Individual studies with prior approval of department head. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**MPH 593. Adulthood and Aging****3 Credits**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies.

**MPH 596. Field Experience****1-4 Credits**

Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. May be repeated for a maximum of 4 credits. Restricted to MPH majors.

**Prerequisite:** consent of department head.

**MPH 597. Graduate Public Health Seminar****1 Credit**

Inter-professional Education Seminar for MPH students.

**MPH 599. Master's Thesis****1-6 Credits**

Minimum of 4 credits required but may be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required. Thesis/Dissertation Grading.

## **MSW-SOCIAL WORK (MASTERS) (MSW)**

**MSW 500. Social Problems and Social Welfare Policy****3 Credits**

An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to change policies that impact vulnerable populations. May be repeated up to 3 credits.

**MSW 503. Policy Analysis and Change****3 Credits**

This course will emphasize policy practice focusing on policy analysis and creating and implementing policy change. Restricted to MSW majors.  
**Prerequisite(s):** MSW 500.

**MSW 509. Sociocultural Concepts and Populations of the Southwest****3 Credits**

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are emphasized.

**MSW 510. Human Behavior and the Social Environment I****3 Credits**

The major theories of human behavior and the life span from conception to adolescence. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Required. May be repeated up to 3 credits. Restricted to: MSW majors.

**Corequisite(s):** MSW 509.

**MSW 514. Human Behavior & the Social Environment II****1-3 Credits (1-3)**

The major theories of human behavior from young adulthood to old age. This course will focus on both areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Consent of Instructor required. Restricted to: MSW majors.

**Prerequisite(s):** MSW 510.

**MSW 520. Social Work Practice I****3 Credits**

This is the first course of a two-course sequence. An introduction to the generalist crosscultural, social work practice perspective with individuals and families, focusing on social work as a profession, social work knowledge base, professional development, relationship building and assessment with individuals and families within a framework of social work values and ethics. May be repeated up to 3 credits.

**Corequisite(s):** MSW 549 and MSW 566, or MSW 551.

**Prerequisite(s)/Corequisite(s):** MSW 510. Restricted to: MSW majors.

**MSW 521. Social Work Practice II****3 Credits**

This is the second course of a two-course sequence. A continuation of the generalist crosscultural, social work practice perspective with individuals and families, focusing on goal setting, contracting, implementation, and outcome assessment. The course also applies the generalist practice perspective and methods to larger systems: groups, organizations, and communities and includes relationship building, assessment, goal setting, contracting, implementation and outcome assessment within a framework of social work values and ethics. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 520.

**Corequisite(s):** MSW 550 and MSW 567, or MSW 552.

**MSW 524. Practice III: Advanced Practice with Individuals****3 Credits**

This class builds on Foundation Year Practice courses (MSW 520, 521) by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 521.

**Corequisite(s):** MSW 556 and MSW 568, or MSW 554.

**MSW 525. Practice IV: Advanced Generalist Practice with Groups****3 Credits**

This course will address the knowledge, values and skills needed to work effectively with diverse populations in group settings. The course will build on Foundation Year courses (MSW 520 and 521) by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 521.

**Corequisite(s):** MSW 556 and MSW 568, or MSW 554.

**MSW 526. Practice V: Advanced Practice with Families****3 Credits**

This class builds on Foundation Year Practice courses (MSW 520 and 521) by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. May be repeated up to 3 credits. Restricted to: S WK,MSW majors.

**Prerequisite(s):** MSW 524, MSW 525.

**Corequisite(s):** MSW 557 and MSW 569, or MSW 555.

**MSW 527. Practice VI: Advanced Practice with Organizations and Communities****3 Credits**

This class builds on Foundation Year Practice courses (MSW 520, 521) by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 524, MSW 525.

**Corequisite(s):** MSW 557 and MSW 569, or MSW 555.

**MSW 547. Social Work Mental Health Practice****3 Credits**

This course is designed to add to the practice sequence for Masters Level students in Social Work. It addresses social work assessment of major mental health issues across the life span with an emphasis on resiliency and coping skills. Culturally responsive practices are applied to the major issues of mental health. Basic psychopharmacology, neurobiology and the ways in which Social Workers interact with clients to aid education and effective treatment of medical interventions will be a prominent part of this course. Evidence-based practices useful for work in various disorders will be incorporated. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 520.

**MSW 549. Generalist Field Practicum A****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning; seminar required. Evaluation criteria for this course will include upholding social work practice standards for interpersonal and ethical conduct. Total of 225 hours in the field each semester is required. 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors. S/U Grading (S/U, Audit).

**Corequisite(s):** MSW 520, MSW 566.

**MSW 550. Generalist Field Practicum B****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning; seminar required. Evaluation criteria for this course will include upholding social work practice standards for interpersonal and ethical conduct. Total of 225 hours in the field each semester is required. Letter grade, 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 549.

**Corequisite(s):** MSW 521, MSW 567.

**MSW 551. Generalist Field Practicum I****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Graded: S/U. Pre/ Crosslisted with: MSW 566.

Restricted to: MSW majors. S/U Grading (S/U, Audit).

**Corequisite(s):** MSW 520.

**MSW 552. Generalist Field Practicum II****3 Credits**

Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Crosslisted with: MSW 567. Restricted to: MSW majors.

**Prerequisite(s):** MSW 551.

**Corequisite(s):** MSW 521.

**MSW 554. Advanced Generalist Field Experience I****3 Credits**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Crosslisted with: MSW 568. Restricted to: MSW majors.

**Prerequisite(s):** MSW 552.

**Corequisite(s):** MSW 524,MSW 525.

**MSW 555. Advanced Generalist Field Experience II****3 Credits**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Crosslisted with: MSW 559. Restricted to: MSW majors.

**Prerequisite(s):** MSW 554.

**Corequisite(s):** MSW 526,MSW 527.

**MSW 556. Advanced Generalist Field Practicum A****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning in advanced generalist practice: seminar required. Total of 250 hours in the field each semester is required. Letter grade, 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 550.

**Corequisite(s):** MSW 524,MSW 525, MSW 568.

**MSW 557. Advanced Generalist Field Practicum B****3 Credits**

Supervised professional practice in a community social service agency, providing experiential instruction and learning in advanced generalist practice: seminar required. Total of 250 hours in the field each semester is required. Letter grade, 3 credits each semester. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 556.

**Corequisite(s):** MSW 526, MSW 527, MSW 569.

**MSW 559. Social Work Practice & Research for Advanced Standing****4 Credits**

This course is required for all advanced standing students and targets provision of the conceptual orientation for the concentration year of the MSW program. The goal of this course is to enhance social work practice theory, knowledge and application skills as well as knowledge in preparation for concentration year courses in advanced generalist social work practice. The key themes and concepts presented, explored and analyzed in this course include: the fit between Social Work code of ethics and personal values and belief systems; analysis of theory, ethics, and conceptual frameworks for concentration year advanced evidenced based Social Work practice courses in diverse settings. Restricted to: MSW Advanced Standing majors.

**MSW 560. Social Work Research I****3 Credits**

Introduction to analytical skills used in social work research: problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human participants in research, and application of research knowledge and professional ethics to social work practice. May be repeated up to 3 credits. Restricted to: MSW majors.

**Corequisite(s):** MSW 500.

**MSW 562. Social Work Research II****3 Credits**

Focused on advanced generalist practice research in multicultural settings. Advanced skills to evaluate practice with individuals, families, groups, organizations, and communities in multicultural settings. Needs assessment as well as program and practice evaluation are emphasized. Restricted to: MSW majors.

**Corequisite(s):** MSW 560.

**MSW 566. Generalist Field Seminar I****3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MSW 551 or MSW 549, MSW 509, MSW 510, MSW 520. Restricted to: MSW majors. S/U Grading (S/U, Audit).

**MSW 567. Generalist Field Seminar II****3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 566.

**Corequisite(s):** MSW 521, MSW 550.

**MSW 568. Advanced Generalist Field Seminar I****3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits. Crosslisted with: MSW 554. Restricted to: MSW majors.

**Prerequisite(s):** MSW 567.

**Corequisite(s):** MSW 556, MSW 524, MSW 525.

**MSW 569. Advanced Generalist Field Seminar II****3 Credits**

The field seminar assists the student in fortifying a relationship between classroom knowledge and the field experience. In addition, it assists the student in the integration of social work practice processes in service planning and delivery. May be repeated up to 3 credits. Restricted to: MSW majors.

**Prerequisite(s):** MSW 568.

**Corequisite(s):** MSW 526, MSW 527, MSW 557.

**MSW 590. Family and Child Welfare Policy****3 Credits**

This course will enhance students' ability to offer child welfare services that respect cultural differences, reflect current policy knowledge concerning child maltreatment, build on the advocacy and protective capacities of individuals, families and communities and encourage permanency for children and preservation of families. Required basic knowledge of child welfare and assessment skills. Outside majors require instructor permission. May be repeated up to 3 credits.

**MSW 591. Systemic Integration of Alcohol and Drug Issues****3 Credits**

Capstone course for the alcohol and drug minor. Covers community, agency, and systemic facilitation of prevention and intervention services for substance-affected families.

**Prerequisite(s):** acceptance into minor or Instructor permission.

**MSW 595. Independent Study****1-3 Credits**

Individual study to augment depth of knowledge in area related to course of study. May be repeated for maximum of 6 credits.

**Prerequisite:** consent of instructor.

**MSW 597. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields. May be repeated for unlimited credit under different subtitles.

**Prerequisite:** consent of instructor.

**MSW 599. Graduate Thesis****6 Credits**

Required for thesis option. May be repeated for a maximum of 6 credits. Restricted to MSW students.

**Prerequisite:** consent of instructor.

## MUS-MUSIC (MUS)

**MUS 101G. An Introduction to Music****3 Credits**

An introduction to music for the non-music major to encourage the enjoyment of listening to and understanding the world's great music from the past to the present.

**MUS 102. Fundamentals of Music****3 Credits**

Introduction to music notation, meter and rhythm, scales, intervals, triads, seventh chords, fundamentals of harmonic progression, and aural skills. For students with little or no music theory background. Traditional Grading with RR.

**MUS 103. Ear Training I****1 Credit**

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Traditional Grading with RR. Restricted to Las Cruces campus only.

**Prerequisite(s):** Passing the Theory Placement exam or making a C or better in MUS 102.

**MUS 104. Ear Training II****1 Credit**

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C- or better in MUS 103.

**MUS 105. Music Theory I****3 Credits**

Introduction to vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis.

**Prerequisite(s):** Passing the Theory Placement exam or making a C or better in MUS 102.

**MUS 106. Music Theory II****3 Credits**

Expansion of vocabulary and syntax of 4-voice 18th c. chorale music through study, harmonic analysis, and part writing.

**Prerequisite(s):** Grade of C or better in MUS 105.

**MUS 121. Concert and Recital Laboratory****0.5 Credits**

Serves as a resource and performance lab for all applied areas of musical study. Music majors are expected to perform during the weekly student recital and must attend a designated number of musical performances during the semester. May be repeated up to 4 credits. Restricted to: Music and Music Education majors. S/U Grading with RR. Restricted to Las Cruces campus only.

**MUS 130. Applied Music****1-2 Credits**

Private or group instruction for non-music majors, secondary instruments, and music majors preparing for 200-level applied music. May be taken for unlimited credit.

**MUS 141. Class Voice I****1 Credit**

Group instruction in voice and vocal pedagogy for instrumental Music Education majors, offering basic principles of healthy vocal production with particular attention to diction, development of vocal range, and the ability to impart that knowledge to elementary, junior and/or high school age students. Restricted to: Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

**MUS 145. Functional Piano I****2 Credits**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**MUS 146. Functional Piano II****2 Credits**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**Prerequisite:** MUS 145 or consent of instructor.

**MUS 147. Functional Piano III****2 Credits**

For music majors preparing for the Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**Prerequisite:** MUS 146 or consent of instructor.

**MUS 150. Orchestra****1 Credit**

Participation in the Las Cruces Symphony at NMSU. This is a full symphony orchestra concentrating on masterworks of the literature. May be taken for unlimited credit.

**MUS 151. Philharmonic Orchestra****1 Credit**

The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 160. University Singers****1 Credit**

Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 161. Concert Choir****1 Credit**

Campus choir composed of both music and non-music majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. May be taken for unlimited credit.

**MUS 162. Master Works Chorus****1 Credit**

Combination campus and community chorus. This group will perform the major chorale compositions for orchestra and/or wind ensemble. May be taken for unlimited credit.

**MUS 163. Jazz Ensembles****1 Credit**

Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 164. Chamber Ensembles****1 Credit**

Small groups of singers and/or instrumentalists that perform chamber music. May be repeated up to 16 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 170. Wind Symphony****1 Credit**

This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 171. Roadrunner Revue Pep Band****1 Credit**

For both music and nonmusic majors. Opportunity to perform a variety of music in a showband setting. May be taken for unlimited credit.

**Prerequisite:** by audition only; contact band office for date and time.

**MUS 172. Marching Band****1 Credit**

For both music and nonmusic majors. Opportunity to perform all varieties of music in a contemporary styled marching unit. May be taken for unlimited credit.

**MUS 174. Percussion Ensemble****1 Credit**

Study and performance of contemporary percussion ensemble literature. May be repeated up to 5 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 180. Symphonic Band****1 Credit**

This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** By audition only.

**MUS 181. Campus Band****1 Credit**

This is a non-auditioned ensemble designed to meet the needs of students from all majors across campus. Music majors are encouraged to enroll while performing on a secondary instrument. Marching band members are also encouraged to take the course to build skills and leadership. This ensemble provides an educational experience and serves as an outlet for students who wish to remain musically active in a less intense setting. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**MUS 201G. History of Jazz in Popular Music: A Blending of Cultures****3 Credits**

Jazz in popular music as it relates to music history and the development of world cultures.

**MUS 202. An Introduction to World Music, Jazz and Music Research****3 Credits**

Introduces world music and jazz within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works. A major component will be the development of effective research and scholarly writing skills for the music major or minor. May be repeated up to 3 credits. Restricted to: Music majors and minors. majors. Restricted to Las Cruces campus only.

**MUS 203. Ear Training III****1 Credit**

Continuation of MUS 104, advanced sight singing, dictation. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C- or better in MUS 104.

**MUS 204. Ear Training IV****1 Credit**

Continuation of MUS 203, advanced sight singing, dictation. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C or better in MUS 203 and MUS 205.

**MUS 205. Music Theory III****3 Credits**

Analysis of Baroque and Classical Music. Vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C or better in MUS 106.

**MUS 206. Music Theory IV****3 Credits**

Analysis of Romantic, Post-Romantic, Impressionist, and Twelve-Tone Music. Vocabulary and syntax of late 19th and early 20th c. Western art music through study, micro/macro analysis, and composition. Restricted to Las Cruces campus only.

**Prerequisite(s):** Grade of C or better in MUS 205.

**MUS 207. Music History and Literature: Antiquity through Baroque****3 Credits**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from antiquity through the end of the Baroque era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: M ED, MUS majors.

**Prerequisite(s):** A grade of C- or better in MUS 103, 105, and 202.

**MUS 230. Applied Music I****1-4 Credits**

Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required.

Restricted to: Music and Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

**Prerequisite(s):** Audition.

**MUS 250. Introduction to Music Education****2 Credits**

Overview of the basic principals and practices of the music education profession in K-12 settings, emphasizing philosophy and history of music education, methodologies commonly utilized in school curricula, music in special education, classroom/rehearsal management and lesson planning. Explores many aspects of public school teaching through class discussions and directed observations. Restricted to Las Cruces campus only.

**MUS 251. Opera Workshop****1 Credit**

Study, translation, analysis, rehearsal and performance of opera. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** by audition only.

**MUS 260. Special Topics I****1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

**MUS 261. Functional Piano IV****2 Credits**

For music majors preparing for Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.

**Prerequisite:** MUS 147 or consent of instructor.

**MUS 262. Diction I****2 Credits**

Introduction to the international phonetic alphabet, and its application to English, Italian, Spanish, and Latin song literature. Main campus only. Restricted to Las Cruces campus only.

**MUS 263. Diction II****2 Credits**

Advanced grammar and detailed study of Italian, German and French diction and song literature for vocal students. Restricted to music majors. Main campus only.

**Prerequisite:** MUS 262 or consent of instructor.

**MUS 273. Introduction to Music Technology****1 Credit**

Introduction to uses of technology in musical settings. Practical applications in digital music notation, MIDI sequencing, and digital audio recording. Restricted to: MUS, M ED majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

**Prerequisite(s):** MUS 105.

**MUS 301. Marching Band Techniques****2 Credits**

This course will help students develop the techniques needed to administer and teach all aspects of a contemporary high school marching band. This includes drill conception and design, instruction, organization, and administration. Stylistic varieties of marching fundamentals, show conception, fundamentals of charting and teaching drill, computer-aided drill design, traditional show design, contemporary show design, rehearsal techniques, and organizational concepts. Restricted to: Music, Music Education majors. Traditional Grading with RR.

**MUS 302. Music History and Literature: Classic through Romantic****3 Credits**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginnings of the Classic era through the end of the Romantic era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: Music Majors and Minors majors.

**Prerequisite(s):** A grade of C- or better in MUS 207.

**MUS 303. Music History and Literature: 20th Century Through the Present****3 Credits**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginning of the 20th Century through the Present. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: MUS minors and majors.

**Prerequisite(s):** A grade of C- or better in MUS 302.

**MUS 315. Brass Techniques I****1 Credit**

Methods and techniques of teaching high brass instruments, for music education majors. Main campus only.

**MUS 316. Brass Techniques II****1 Credit**

Methods and techniques of teaching low brass instruments, for music education majors. Main campus only.

**MUS 317. Woodwind Techniques I****1 Credit**

Methods and techniques of teaching high woodwind instruments, for music education majors. Main campus only.

**MUS 318. Woodwind Techniques II****1 Credit**

Methods and techniques of teaching saxophone and double reed instruments, for music education majors. Main campus only.

**MUS 319. String Techniques I****1 Credit**

Methods and techniques of teaching low string instruments, for music education majors. Main campus only.

**MUS 320. String Technique II****1 Credit**

Methods and techniques of teaching high string instruments, for music education majors. Main campus only.

**MUS 321. Instrumental Techniques for Vocal Music Education Majors****2 Credits**

Methods of teaching brass, woodwind, percussion, stringed and fretted instruments for vocal music education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 322. Guitar Methods****1 Credit**

Methods and techniques of teaching guitar, for Music Education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 323. Percussion Technique I****1 Credit**

Methods and techniques of teaching fundamental percussion instruments (snare drum, timpani, keyboards and essential accessories). May be repeated up to 1 credits. Restricted to: MUS, M ED majors.

**MUS 324. Percussion Technique II****1 Credit**

Methods and techniques of teaching marching percussion, drum set, and a continuation of techniques discussed in MUS 323. May be repeated up to 1 credits. Restricted to: MUS, M ED majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C- or better in MUS 323.

**MUS 325. Beginning Conducting****1 Credit**

A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning technique applicable to all ensembles. Reading of musical scores with application via laboratory ensemble experience is included. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 204 and 206.

**MUS 326. Instrumental Conducting****3 Credits**

Will continue from MUS 325 in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques as it relates to the instrumental ensemble. The class will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. May be repeated up to 3 credits. Restricted to: MUS, M ED majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C- or better in MUS 325.

**MUS 327. Choral Conducting****3 Credits**

Continuation of conducting study with emphasis on choral rehearsal techniques, ensemble management, and literature. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 325.

**MUS 330. Applied Music II****1-4 Credits**

Continuation from MUS 230. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 230 plus a juried audition.

**MUS 339. Survey of Music Business****3 Credits**

Survey of career options and exploration of current events/trends within the Music Industry. Non-Music Business majors may be admitted with instructor's approval.

**MUS 340. Junior Recital****1 Credit**

Public solo performance under the supervision of the appropriate applied instructor. 30 minutes of musical performance is required. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Corequisite(s):** MUS 330.

**MUS 346. Elementary Music Methods****2 Credits**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in an elementary school. Emphasis on methodology of Kodaly and Orff, teaching in a multicultural setting, and developing reflective practitioners. This course requires field experience in the public schools. Restricted to: Music Education majors.

**Prerequisite(s):** A grade of C or better in MUS 250 and passing the TEP exam.

**MUS 349. Secondary Music Methods****2 Credits**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on teaching in a multicultural setting and developing reflective practitioners. Restricted to: Music Education majors.

**Prerequisite(s):** A grade of C or better in MUS 346.

**MUS 350. Chamber Music****1 Credit**

Small performing ensembles that may include strings, woodwinds, brass, pianos, percussion, and voices. May be repeated up to 16 credits.

**Prerequisite(s):** by audition only.

**MUS 351. Opera Workshop****1 Credit**

Study, translation analysis, rehearsal and performance of opera. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 360. Special Topics II****1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

**MUS 361. Concert Choir II****1 Credit**

Composed of both music and nonmusic majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. Students must assume leadership role. May be repeated up to 88 credits.

**Prerequisite(s):** by audition only.

**MUS 362. Philharmonic Orchestra II****1 Credit**

The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 363. Jazz Ensembles II****1 Credit**

Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 365. Composition I****2 Credits**

Significant forms for various media. Emphasis on structural aspects of original composition. Restricted to: M ED, MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 105.

**MUS 368. University Singers II****1 Credit**

Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits. Consent of Instructor required.

**Prerequisite(s):** by audition only.

**MUS 370. Wind Symphony II****1 Credit**

This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 372. Marching Band II****1 Credit**

Composed of both majors and nonmajors. Opportunity to perform all varieties of music in a contemporary style marching unit. May be repeated up to 5 credits. Consent of Instructor required. Traditional Grading with RR.

**MUS 374. Percussion Ensembles II****1 Credit**

Study and performance of contemporary percussion ensemble literature. Students must assume a leadership role. May be repeated up to 5 credits.

**Prerequisite(s):** by audition only.

**MUS 380. Symphonic Band II****1 Credit**

This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits.

**Prerequisite(s):** by audition only.

**MUS 381. Campus Band II****1 Credit**

This is a non-auditioned ensemble designed to meet the needs of students from all majors across campus. Music majors are encouraged to enroll while performing on a secondary instrument. Marching band members are also encouraged to take the course to build skills and leadership. This ensemble provides an educational experience and serves as an outlet for students who wish to remain musically active in a less intense setting. May be repeated up to 10 credits.

**MUS 386. Applied Music Pedagogy and Literature I****2 Credits**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 390. Survey of Wind Literature****2 Credits**

An examination of beginning to advanced literature for wind bands with an emphasis on the needs of middle and high school ensembles. It will include a means to determine the quality of a piece as well as the standardized level of difficulty (grading). Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C- or better in MUS 204 and 206.

**MUS 391. Survey of Orchestral Literature****2 Credits**

An examination of beginning to advanced literature for both string orchestra and symphony orchestra with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C- or better in MUS 204 and 206.

**MUS 392. Survey of Choral Literature****2 Credits**

An examination of beginning to advanced literature for choir with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C- or better in MUS 204 and 206.

**MUS 413. Form and Analysis****3 Credits**

Forms in tonal music and basic analytic techniques including music from diverse cultures and media.

**Prerequisite(s):** A grade of C- or better in MUS 204 and MUS 206.

**MUS 415. Orchestration****3 Credits**

Scoring for full orchestra and various instrumental combinations with consideration of instrument timbres, strengths, weaknesses and ranges. Restricted to: Music and Music Education majors.

**Prerequisite(s):** A grade of C or better in MUS 204 and 206.

**MUS 417. Studio Accompanying****2 Credits**

Practical application of collaborative piano skills in a studio setting for Piano Performance majors. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 421. Music of the Baroque Era****3 Credits**

An overview of the music of the Baroque era with an emphasis on history and literature.

**Prerequisite(s):** MUS 303.

**MUS 422. Music of the Classic Era****3 Credits**

An overview of the music of the Classic era with an emphasis on history and literature.

**Prerequisite(s):** MUS 303.

**MUS 423. Music of the Romantic Era****3 Credits**

An overview of the music of the Romantic era with an emphasis on history and literature.

**Prerequisite(s):** MUS 303.

**MUS 429. Opera and Music Drama****3 Credits**

Lyrical drama of the Greeks through works of Wagner and Verdi to contemporary opera.

**Prerequisite:** MUS 303 or consent of instructor.

**MUS 430. Applied Music III****1-4 Credits**

Continuation from MUS 330. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of C or better in MUS 330 plus a juried audition.

**MUS 440. Senior Recital****1-2 Credits (1-2)**

Public solo performance under the supervision of the appropriate applied instructor. 60 minutes of musical performance is required for enrollment of 2 hours credit. 30 minutes of musical performance is required for enrollment of 1 hour credit. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**Corequisite(s):** MUS 430.

**MUS 441. Supervised Studio Teaching****2 Credits**

Teaching of private lessons under supervision. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

**MUS 450. Research Methods****3 Credits**

Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Restricted to majors. Main campus only. No S/U option.

**Prerequisite:** consent of instructor.

**MUS 451. Orchestra II****1 Credit**

Las Cruces Symphony at NMSU, a full symphony orchestra concentrating on masterworks of the literature. Students must assume a leadership role. May be repeated up to 88 credits.

**Prerequisite(s):** by audition only.

**MUS 455. Music Business Internship****3 Credits**

Capstone course for the Music Business degree. Working with the music business coordinator, students must have been accepted as an intern in a music business setting before enrolling. Credit given for the internship based on criteria developed for each placement. Restricted to majors. S/ U only.

**Prerequisite(s):** MUS 330 and piano proficiency.

**MUS 470. Special Topics III****1-3 Credits**

Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit.

**MUS 471. Graduate Theory Review****3 Credits**

Comprehensive and accelerated study of modes, diatonic harmony, and classical form of the common practice period. Restricted to: Music majors. Traditional Grading with RR.

**MUS 475. Intermediate Conducting****3 Credits**

Serves as a bridge from undergraduate conducting study to the graduate level. Advanced undergraduate students may enroll to learn how the graduate program in conducting functions. The course also serves as the introductory experience for newly admitted graduate conducting majors. After successful completion of this course, students will be able to: Study musical scores from a conducting perspective; Demonstrate effective predetermined gestures and movements; Lead an ensemble; Research and give presentations related to composers and their music; Demonstrate advanced knowledge of conducting practices.

**Prerequisite(s):** A grade of C- or better in MUS 326 or 327.

**MUS 477. Graduate Music History Review****3 Credits**

Comprehensive and accelerated study of music history from antiquity to the present. Restricted to: Music majors. Traditional Grading with RR.

**MUS 486. Applied Music Pedagogy and Literature II****2 Credits**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music majors. Traditional Grading with RR.

**MUS 498. Independent Study****1-3 Credits**

For students with a strong musical background wishing to explore content beyond the traditional curriculum. Restricted to majors. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**MUS 511. Survey of Traditional Harmony****3 Credits**

Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Restricted to: Music majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of B or better in MUS 471.

**MUS 513. Twentieth Century Art Music****3 Credits**

Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school in historical context. Restricted to: Music majors.

**Prerequisite(s):** A grade of B or better in MUS 471.

**MUS 518. Seminar in Music Theory****3 Credits**

Varying topics in Music Theory, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: Music majors. Traditional Grading with RR.

**Prerequisite(s):** A grade of B or better in MUS 471.

**MUS 519. Seminar in Music History****3 Credits**

Varying topics in Music History, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 520. Music of the Middle Ages and Renaissance: History and Literature****3 Credits**

An overview of the music of the Middle Ages and Renaissance with an emphasis on history and literature. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 521. Music of the Baroque Era: History and Literature****3 Credits**

An overview of the music of the Baroque Era with an emphasis on history and literature.

**MUS 522. Music of the Classical Era: History and Literature****3 Credits**

An overview of the music of the Classical era with an emphasis on history and literature. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 523. Music of the Romantic Era: History and Literature****3 Credits**

An overview of Romantic era music, with an emphasis on history and literature. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 527. History and Analysis of the Symphony****3 Credits**

Historical background and development of the symphony from its inception (ca. 1740s) to mid-twentieth century. Analysis of major works by significant composers with emphasis on Sonata form. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 471 and 477.

**MUS 528. The Symphony in Historical Context****3 Credits**

Considers the historical development of the symphony, as a musical genre, from its inception to the 20th century. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 529. Opera and Music Drama****3 Credits**

Lyric drama of the Greeks through works of Wagner and Verdi to contemporary opera. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 477.

**MUS 530. Seminar in Music Education****3 Credits**

Varying topics in Music Education, providing a more specific and in-depth study of the particular topic. Restricted to: MUS majors.

**MUS 531. Music in Elementary Schools****3 Credits**

This course is designed to provide experiences which will help the student gain skills to appropriately enhance the musical growth of children in K–6 classrooms. The course participants personal skill and understanding of musical concepts will be developed; musical needs and capabilities of young children will be investigated; methods of teaching music to young children will be explored. Restricted to: MUS (Music Ed track only) majors.

**MUS 535. Current Issues in Music Education****3 Credits**

This course examines the rich and challenging complexities of music teaching and learning from a variety of perspectives. Educational theory to pedagogical inquiry of current educational practice will be examined, calling students to critically reflect on such professional activities as lesson planning, curriculum design, repertoire choice, program assessment, advocacy in the arts, and student evaluation. Restricted to: MUS (Music Ed track only) majors.

**MUS 540. Graduate Recital/Analytical Paper****4 Credits**

This course is for students completing a Master of Music with a Performance emphasis. A public recital will be given and an accompanying research paper will be submitted. Restricted to: MUS majors.

**MUS 574. Advanced Choral Conducting I****3 Credits**

This course will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 575. Advanced Choral Conducting II****3 Credits**

This is the final course in preparation for the student's graduate conducting concert. It will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 574.

**MUS 576. Advanced Instrumental Conducting I****3 Credits**

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 577. Advanced Instrumental Conducting II****3 Credits**

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 576.

**MUS 578. Advanced Choral Literature****2 Credits**

An examination of significant choral works from 1200 to the present, including composers, genres, and historical context Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 579. Advanced Instructional Literature****2 Credits**

An examination of significant instrumental works from the Baroque period to the present, including composers, genres, and historical context Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 475.

**MUS 580. Ensemble Performance****1 Credit**

Performance in university ensembles. May be repeated up to 99 credits.

**Prerequisite(s):** by audition only.

**MUS 582. Applied Music****2-4 Credits**

For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. May be repeated for a maximum of 16 credits.

**Prerequisites:** audition and consent of instructor.

**MUS 586. Applied Music Pedagogy and Literature III****2 Credits**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Restricted to: MUS majors.

**Prerequisite(s):** A grade of B or better in MUS 486.

**MUS 598. Special Research Programs****1-4 Credits**

May be taken for unlimited credit.

**MUS 599. Master's Thesis****15 Credits**

Thesis.

## NA - NURSING ASSISTANT (NA)

**NA 101. Nursing Assistant Theory and Lab****6 Credits (5+3P)**

Nurse aide skills with emphasis on a bio-psychosocial-cultural approach to client care. Practice of these skills is provided in the laboratory as well as at a clinical site. Successful completion of the course prepares and qualifies the student to take the NACES certification examination. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (CCDR 110N with C or better OR appropriate placement score) and (CCDE 110N with C or better OR appropriate placement score) and (CCDM 103N with C or better OR appropriate placement score).

**NA 104. Nursing Assistant Fundamentals****3 Credits**

This course prepares students for employment as a Nursing Assistant in a Long Term Care Facility. Theory and basic nursing care skills will be taught with an emphasis being placed on the psychosocial-cultural approach to client care. Students will learn communication skills, basic anatomy and physiology, growth and development, infection control, body mechanics, basic nutrition, client/resident elimination needs, the client/resident unit, vital signs, range of motion exercises, bed making, rehabilitation and restorative care, client admission and discharge, common health problems, dealing with death and dying, and basic medical terminology. NA 104 and NA 104L (laboratory) must be successfully completed with a C- or better in order to continue to NA 105 Nursing Assistant Clinical. NA 105 must also be successfully completed with a C- or better to be eligible to take the state certification competency examination. Attendance is required to meet the federal requirements for training hours and content prior to direct contact with a patient/resident and the state competency examination. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Test out of all CCDE and CCDD courses and eligible to take ENGL 111G.

**Corequisite(s):** NA 104 L.

**NA 104 L. Nursing Assistant Fundamentals Lab****1 Credit**

This course prepares students for employment as a Nursing Assistant in a Long Term Care Facility. Students will learn and demonstrate personal care skills including bathing, grooming, dressing, toileting, assisting with eating and hydration, skin care, transfers and positioning. Students will also learn and demonstrate the use of assistive devices, and how to maintain resident safety, dignity and privacy. NA 104 & NA 104L must be successfully completed with a C- or greater in order to continue to NA 105 Clinical. NA 105 must be successfully completed with a C- or greater to be eligible to take the state certification competency examination.

**Prerequisite(s)/Corequisite(s):** NA 104. Prerequisite(s): English COMPASS score of 35 or greater or CCDE 110N, and reading COMPASS score of 55 or greater or CCDD 105N. Restricted to Community Colleges campuses only.

**NA 105. Nursing Assistant Clinicals****4 Credits (3+3P)**

Extension of basic fundamentals of personal care, including theory, skills and clinical experience leading to the certified Nursing Assistant Examination at the conclusion of the semester. Continuation of NA 104. Requires a C or better to pass. Restricted to: Community Colleges only.

**Prerequisite(s):** C or better in NA 104 or consent of instructor.

**NA 108. Disabilities Support Services****4 Credits (3+2P)**

Beginning level preservice preparation for providing in-home care for individuals with disabilities. Crosslisted with: AHS 108. Restricted to: Community Colleges only.

**Prerequisite(s):** NA 101 or NA 104 or Consent of Instructor.

**NA 109. Phlebotomist Basic****4 Credits (2+4P)**

This course provides the latest information, techniques, skills, and equipment for blood and specimen collection based on the standards of the Clinical and Laboratory Standards Institute, Needlestick Prevention Act, Joint Commission 2008 National Patient Safety Goals, OSHA and CDC. An advanced skills lab is included in the course to provide a "hands-on" practice experience and a 30 hour practicum in a supervised work environment collecting blood and specimens on actual patients for laboratory tests. Attendance is mandatory. Prepares students for employment as a phlebotomist in health care settings. Requires a "C" or better to pass. Upon successful completion of the course, student has the opportunity to test for National Healthcareer Certification. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** BIOL 154 or BIOL 226. Restricted to Community Colleges campuses only.

**NA 110. Electrocardiogram Technician Basic****4 Credits (3+3P)**

Prepares students for employment as an Electrocardiogram Technician. Includes basic theory of the cardiovascular system, cardiac rhythm interpretation, 12 lead ECG lead placement, and ECG equipment trouble shooting. The course includes an advanced skills laboratory for "hands-on" practice and 16 hours of supervised clinical in the work environment assisting with ECG testing. Attendance is mandatory. Course requires a grade of "C" or better to pass. Upon successful completion of course, student has the opportunity to test for National Healthcareer Certification. Restricted to Community Colleges campuses only.

**Prerequisite(s):** BIOL 154 OR BIOL 225 & BIOL 226.

**NA 111. Alzheimer/Dementia Care Focus****3 Credits**

Students will learn respectful care of Alzheimer/Dementia persons while ensuring their dignity, maximizing safe independence focusing on strengths and abilities. Pre/

**Prerequisite(s)/Corequisite(s):** NA 104 or NA 101. Restricted to: Community Colleges only.

**NA 112. Patient Care Assistant****4 Credits (2+4P)**

This course prepares students to become patient care assistants (certified nursing assistant [CNA]). The course prepares students in the areas of critical thinking, collaboration with healthcare team members and performance of Certified Nursing Assistant skills within acute care units including: out-patient care unit (pre-operative), medical-surgical unit, orthopedic unit, mother-baby (obstetrics) and the mental health inpatient unit. Lab and clinical time will include learning skills in a practice setting with mannequins and in a hospital for acute care skill learning and application. Must pass course with a C- or better.

**Prerequisite(s):** NA-101 or current State of New Mexico Certified Nursing Assistant (CNA) certificate (CNA certification must remain current through end of course).

**Corequisite(s):** Current Basic Life Support (BLS) for the Health Care Provider (American Heart Association) (BLS certification must remain current through end of course).

**NA 115. Phlebotomist Technician****6 Credits (3+6P)**

Basic theory and skills of phlebotomy following OSHA and Center for Disease Control guidelines. Prepares students for the requirements of testing for the ASCP certification exam and employment in a healthcare organization as a phlebotomist in licensed settings. Laboratory hours include infection control skills & practice, patient assessment & teaching, and practice in venipuncture. Clinical time includes clinical laboratory processes and operations, patient assessment, venipuncture, and exposure to clinical policies and procedures. Upon successful completion students are workforce ready.

**Prerequisite(s)/Corequisite(s):** OEEM 101. Restricted to Community Colleges campuses only.

**NA 204. Patient Care Technician****4 Credits (3+3P)**

This course will prepare Certified Nursing Assistants (CNAs) to work in the acute care setting through an expansion of their existing basic skill set. Students will acquire expanded acute care skills, critical thinking skills, and knowledge in caring for patients of all ages. Currently CNA certified. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (NA 104, NA 105, NA 109, NA 110, AHS 120, and (BIOL 154 or (BIOL 225 & BIOL 226))).

**Corequisite(s):** NA 205.

**NA 205. Patient Care Technicians Practicum****4 Credits (1+9P)**

This course will prepare Certified Nursing Assistants (CNAs) to work in the acute care setting through an expansion of their existing basic skill set. Students will acquire expanded acute care skills, critical thinking skills, and knowledge in caring for patients of all ages. Students will go to acute care settings to practice newly acquired skills. Must have a "C" or better to pass. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (NA 104, NA 105, NA 109, NA 110, AHS 120, & (BIOL 154 or (BIOL 225 & BIOL 226))) Currently CNA Certified.

**Corequisite(s):** NA 204.

**NA 212. Medical Assistant Capstone Course****5 Credits (4+3P)**

This course provides the student with entry-level theory and limited "hands-on" training in basic and routine clinical office tasks. The course will equip the Medical Assistant (MA) student with the competencies required to perform in a medical office under the direct supervision of a physician. The graduate will be able to assist the physician with physical exams, ECGs, phlebotomy, and minor surgical procedures. May be repeated up to 5 credits. CNA Certification within the last 5 years.

**Prerequisite(s):** NA 105, NA 110, NA 109, AHS 120, BIOL 154, HIT 110, BOT 208, HIT 228, HIT 248, HIT 258.

**NA 214. Medical Assistant Practicum****6 Credits (1+6P)**

This course is the practicum for NA 212 Medical Assistant Fundamentals Capstone Course. Students will prepare for a career as a medical assistant in medical offices and clinics. During practicum students will observe and participate in 180 hours in a supervised work environment using knowledge and skills learned in NA 212. This course includes weekly post-practicum conferences with the instructor. The student will be evaluated by both the employer and the instructor. Requires a "C" or better to pass. Upon successful completion the student may be eligible to test for National Certification. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** NA 212. Prerequisite(s): NA 105, NA 110, NA 109, AHS 120, BIOL 154, HIT 110, BOT 208, HIT 228, HIT 248, HIT 258. CNA Certified within the last 5 years. Restricted to Community Colleges campuses only.

## NAV-NAVAJO (NAV)

**NAV 101. Introduction to Navajo Studies****3 Credits**

Covers geography, demography, institutions of modern Navajo society with historical overview. Restricted to: Community Colleges only.

**NAV 111. Elementary Navajo I****4 Credits**

Navajo for beginners with emphasis on speaking skills.

**Prerequisite:** not open to Navajo-speaking students except by consent of instructor.

## NURS-NURSING (NURS)

**NURS 120. Introduction to Pharmacology****3 Credits**

General principles of pharmacology including methods of administration, effect on the body, interactions with other drugs, and classification of drugs. Focus on the health care provider's role in safe pharmacologic intervention. Restricted to Allied Health majors. Restricted to: Community Colleges only.

**NURS 130. Foundations of Pharmacology****3 Credits**

This course provides the nursing student with an introduction to the foundations of pharmacology including: science of drug action, principles of medication administration, accurate calculation of drug doses, medication therapy across the lifespan, application of medications to treat health alterations, normal and adverse responses by the client to medication therapy, medication safety, medication regulation, national patient safety goals, and appropriate nursing interventions to achieve the desired goals of medication therapy. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 147 & NURS 149.

**NURS 134. Foundation of Nursing Skills and Assessment**  
**3 Credits (1+6P)**

This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan. Open to students who have been accepted into the nursing program. Restricted to: NUR majors. Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 136 & NURS 137 or permission of the Program Director.

**NURS 136. Foundations of Nursing Practice**  
**6 Credits (4+6P)**

This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and foundational nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in the simulation lab, long-term care, the community, and rehabilitation settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of one adult client and to develop care planning skills related to actual problems. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 134, NURS 136 lab & NURS 137 or permission of the Program Director.

**NURS 137. Care of Geriatric Patient**  
**3 Credits**

This course will introduce the nursing student to foundational concepts of age-appropriate/specific care of the older adult who represents the largest population of individuals placing demands on the healthcare system. It includes basic and complex concepts and issues related to care of the older client across the care continuum, provision of cost-effective care in a resource sparse environment. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NURS majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Admission into the nursing program.

**Corequisite(s):** NURS 134 & NURS 136 or permission of the Program Director.

**NURS 140. Pathophysiology for Allied Health Professionals**  
**3 Credits**

Introduction to the nature of disease and its effect on body systems. Deals with the disease processes affecting the human body via an integrated approach to specific disease entities. Includes a review of normal functions of the appropriate body systems. Diseases are studied in relationship to their etiology, pathology, physical signs and symptoms, diagnostic procedures, complication, treatment modalities, and prognosis. Restricted to Allied Health and Health Information Technology majors. Restricted to: Community Colleges only.

**NURS 146. Common Health Deviations**  
**6 Credits (4+6P)**

Common health deviations and the manner by which they alter various body functions are explored. The role of the licensed practical nurse in assisting clients with common health deviations is presented. Ethical and legal implications and the role of the practical nurse are also considered. The licensed practical nursing student will utilize the application of knowledge to client care situation both in the subacute and acute care settings. The nursing process is presented as guide for coordinating client care. Grade of C or better. May be repeated up to 6 credits.

Restricted to: NURSING majors. Restricted to Carlsbad campus only.

**Prerequisite(s):** NURS 153, NURS 156, NURS 154, NURS 157, and NURS 210 or consent of program director.

**NURS 147. Adult Health I**  
**6 Credits (4+6P)**

This course focuses on application of the nursing process and theoretical concepts of care for adults with commonly occurring health problems. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to continue development of: prioritization skills, proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one adult client. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NUR majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 130, NURS 147 lab, & NURS 149, or permission of the Program Director.

**NURS 148. Physical Assessment**  
**2 Credits (1+3P)**

Introduction of concepts and techniques of interviewing, history taking, review of body systems, and physical assessment of an adult client. The student should be able to apply knowledge of anatomy and physiology, assessment skills, communication skills, cultural awareness, nursing process, critical thinking skills, teaching skills, and psychomotor skills. Restricted to: Community Colleges only.

**NURS 149. Mental Health Nursing****3 Credits (2+3P)**

This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to develop ability to develop: proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one client across the life span with acute/chronic mental health needs. Students must be concurrently enrolled in both the lecture and lab sections of this course. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 130, NURS 147, & NURS 149L, or permission of the Program Director.

**NURS 150. Medical Terminology****3 Credits**

Understanding of the basic elements of medical words. Use of medical abbreviations. Same as OEHO 120 and BOT 150.

**NURS 153. Medication and Dosage Calculation****1 Credit**

Techniques of dosage calculation for medication and fluid administration. RR applicable.

**Prerequisite(s):** Meet NMSU basic skills requirement in mathematics or consent of program director.

**Corequisite(s):** NURS156 and NURS154.

**NURS 154. Physical Assessment****2 Credits**

Beginning techniques of physical assessment by systems will be presented using the nursing process as a guide for providing safe client centered care throughout the life span. Grade of C or better is required. May be repeated up to 2 credits. Restricted to: NURSING majors.

Restricted to Carlsbad campus only.

**Prerequisite(s):** BIOL 154 or BIOL 225 or consent of program director.

**Corequisite(s):** NURS 153,NURS 156.

**NURS 155. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes.

**NURS 156. Basic Nursing Theory and Practice****6 Credits (4+6P)**

Introduction to the nursing profession and the beginning skills of nursing practice as it relates to normalcy. The nursing process is presented as a means of guiding the student in providing safe client centered care. Ethical and legal aspects of nursing practice are also included. Basic clinical nursing skills will be presented and practiced in the nursing lab.

The student will perform these skills with clients in an actual health care setting. May be repeated up to 6 credits. Restricted to: NURSING majors.

Restricted to Carlsbad campus only.

**Prerequisite(s):** Consent of Program Director.

**Corequisite(s):** NURS 153,NURS 154.

**NURS 157. Maternal/Child Health Deviations****8 Credits (6+6P)**

The concepts and principles of nursing care of the family from conception to adolescence. Utilizing the nursing process, the student provides safe client centered care to diverse clients and families. Theoretical instruction is applied to client care situation. Students collaborate with clients, families and the interdisciplinary team in meeting health care needs. Experiences may occur in any of the regional health care facilities. Grade of C or better required. May be repeated up to 8 credits. Restricted to: NURSING majors. Restricted to Carlsbad campus only.

**Prerequisite(s):** NURS 156, NURS 153, and NURS 154 or consent of program director.

**Corequisite(s):** NURS 210.

**NURS 182. Legal and Ethical Issues in Nursing Practice****2 Credits**

Introduction to legal and ethical implications of nursing practice (through the holistic approach to wellness) as a registered nurse. Restricted to: Community Colleges only.

**NURS 201. Special Topics****1-4 Credits**

Specific topics to be announced in the Schedule of Classes. May be repeated for a maximum of 10 credits. Restricted to: Community Colleges only.

**Prerequisite:** admission to the nursing program.

**NURS 209. Independent Study****1-4 Credits**

Individual studies to meet identified student needs. May be repeated for a maximum of 10 credits. Restricted to: Community Colleges only.

**Prerequisite:** admission to the nursing program.

**NURS 210. Pharmacological Requisites of the Childbearing Family****1 Credit**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care will be discussed focusing on medications commonly utilized with the childbearing family. Medication classes to be discussed include labor and delivery, analgesic, vitamins, respiratory, gynecological, endocrine, and anti-microbial/anti-infective drugs. Grade of C or better required. Restricted to: Carlsbad campus only.

**Prerequisite(s):** BIOL 225 and BIOL 226 or consent of instructor and NURS 153, NURS 154 and NURS 156.

**Corequisite(s):** NURS 157.

**NURS 211. Pharmacological Requisites of Simple Health Deviations****1 Credit**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care are addressed focusing on medications related to the psychiatric, gastrointestinal, musculoskeletal, gynecological, hematological, and anti-neoplastic client. Grade of C or better required. Restricted to: Carlsbad campus only.

**Prerequisite(s):** BIOL 225 and BIOL 226 or consent of instructor and NURS 153,NURS 154, NURS 156, NURS 157 and NURS 210.

**Corequisite(s):** NURS 246 and NURS 258.

**NURS 212. Pharmacological Requisites of Complex Health Deviations  
1 Credit**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care is examined focusing on medications related to complex health deviations. Drug classes to be discussed include cardiovascular, renal, endocrine, and neurological. Grade of C or better required.

Restricted to: Carlsbad campus only.

**Prerequisite(s):** BIOL 225 and BIOL 226 or consent of instructor, and NURS 153, NURS 154, NURS 156, NURS 157, NURS 246, NURS 258, NURS 210 and NURS 211.

**Corequisite(s):** NURS 256 and NURS 260.

**NURS 224. Maternal Child Nursing  
5 Credits (4+3P)**

This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation lab, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NUR majors.

Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 224 lab, NURS 235, & NURS 236, or permission of the Program Director.

**NURS 226. Adult Health II  
6 Credits (4+6P)**

This course focuses on application of nursing process and theoretical concepts of care for adults with complex health alterations. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to apply: prioritization skills, maintain proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, and care planning skills related to patient actual, psychosocial, and potential problems in the delivery of nursing care to meet needs of three adult clients. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program may enroll in this course. Restricted to: NUR majors.

Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 224, NURS 226 lab, & NURS 235 or permission of the Program Director.

**NURS 234. Community Health Nursing  
1 Credit**

This course provides an introduction to community health, focusing on health care systems, epidemiology, and nursing care of individuals, families and aggregates of varied cultural backgrounds. Primary, secondary, and tertiary prevention are emphasized. Diverse roles of the community health nurse are examined. Educational theories and their applications are explored. Restricted to: Community Colleges only.

**NURS 235. Nursing Leadership and Management  
1 Credit**

This course introduces the intermediate nursing student to professional practice principles of nursing leadership and management including: health policy and politics, fiscal management & budgeting, conflict management, decision making, interdisciplinary practice, working with teams, roles in disaster planning and management, application of standards of care to risk management, organization of care delivery, health care systems, processes, and practice environments. May be repeated up to 1 credits. Restricted to: NUR majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 224, NURS 226 & Clinical Or Permission of the Program Director.

**NURS 236. Nursing Preceptorship - Adult Health III  
6 Credits (2+12P)**

This course is the final course involving care of the patient with acute or chronic illness. It focuses on care of patients with complex or multi-system problems allowing the graduating nursing student to discuss and apply all the skills learned in previous nursing courses. After successfully passing the HESI exam, students have clinical practice with preceptor in various health care settings. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to: organize care of a group of clients, maintain proficiency in performance of nursing skills, collaborate with clients, families, peers and health care team members, and support care planning skills related to patient actual, psychosocial, and potential problems in the delivery of nursing care to meet needs of the preceptors group of clients. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program and have successfully completed all level 1, 2 and 3 nursing courses may enroll in this course. Clinical may include inpatient or outpatient care, days, evenings, nights, or weekend experiences. Students are required to work the preceptors assigned schedule. Restricted to: NUR majors.

Restricted to: Community Colleges only.

**Prerequisite(s):** Admission into the Nursing Program.

**Corequisite(s):** NURS 201, NCLEX Review or permission of the Program Director.

**NURS 246. Health Deviations I  
7 Credits (4+9P)**

Introduction to medical/surgical clients, whose health care needs are routine and predictable. Focus is on simple health deviations, including concepts relative to health promotion and maintenance. The nursing process is utilized to provide evidenced based, safe client centered care. Students are expected to apply clinical judgment, communicate and collaborate with clients and the interdisciplinary team in providing care for a group of two to three clients. Grade of C or better required. May be repeated up to 7 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

**Prerequisite(s):** NURS 153, NURS 156, NURS 154, NURS 157 and NURS 210 or consent of program director.

**Corequisite(s):** NURS 211, NURS 258.

**NURS 256. Health Deviations II****8 Credits (4+12P)**

Concepts and principles applied to clients with complex health deviations. Building upon knowledge gained in NURS 246, focus will be on acutely ill clients. The nursing process continues to serve as a guide to provide safe, client centered care. The student collaborates with the interdisciplinary team in all aspects of client care. Student experiences the role of the staff nurse under the guidance and direction of the nursing instructor. Grade of C or better required. May be repeated up to 8 credits.

Restricted to: Nursing majors. Restricted to Carlsbad campus only.  
**Prerequisite(s):** NURS 153, 154, 156, 157, 210, 211, 246, and 258 or consent of program director.

**Corequisite(s):** NURS 212, NURS 260.

**NURS 258. Psychosocial Requisites: A Deficit Approach****3 Credits (2+3P)**

Nursing theory and practice as it relates to the care of the client experiencing psychosocial health deviations. The role of the nurse is discussed along with the ethical and legal aspects of care for the client with psychosocial disorders. Building upon the communication skills of listening and responding, the student develops the therapeutic skills of interpersonal relationships. Grade of C or better is required. May be repeated up to 3 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

**Prerequisite(s):** NURS 153, 154, 156, 157, 210, and 246 or consent of program director.

**Corequisite(s):** NURS 211, NURS 246.

**NURS 260. Management of Patients with Health Deviations****2 Credits (2)**

A capstone course to the nursing program in which principles in management and delegation to less prepared personnel is explored. A review of leadership roles, legal issues, quality initiatives, informatics and scope of practice is included. Preparation for the NCLEX is an integral portion of the course. Grade of C or better is required. May be repeated up to 2 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

**Prerequisite(s):** NURS 153, 154, 156, 157, 210, 211, 246, and 258 or consent of program director.

**Corequisite(s):** NURS 212, NURS 256.

**NURS 270. The Adult Client II****5 Credits (2+9P)**

Care of adult clients experiencing chronic, life-threatening, and end-of-life health alterations with emphasis on the geriatric population using a holistic approach to wellness. Nursing process, pathophysiology, pharmacology, diet therapy, and alternative therapies are stressed throughout the course. Clinical component will provide an opportunity to apply the nursing process in both the hospital and community setting. Restricted to: Community Colleges only.

**Prerequisite(s):** NURS 170, NURS 172, NURS 173L, NURS 180, and NURS 185.

**Corequisite(s):** NURS 285.

**NURS 272. Care for the Aging Client****1 Credit**

Normal physiological changes of aging and nursing implications related to safety and wellness. Restricted to: Community Colleges only. Restricted to NURS majors.

**NURS 275. Holistic Approach to Pharmacotherapeutic Interventions II****2 Credits**

Level II. Holistic approach to the study of basic pharmacology concepts. Includes pharmacodynamic phases of drug interaction. Nursing process is discussed in relation to medication administration. Special emphasis on the role of the nurse and basic concepts related to specific drug categories. Restricted to majors. Community Colleges only.

**Prerequisite:** NURS 185.

**Corequisites:** NURS 280 and NURS 283.

**NURS 280. Women's Health Issues****4 Credits (2+6P)**

Consists of lecture and associated clinical/laboratory experiences that focus on the holistic health concerns for women and the care of families expecting birth. Emphasis placed on the wellness of normal and high-risk women's health, including maternal and newborn care. The nursing process will be utilized to develop caring interventions and effective community communication through teaching healthy strategies. Restricted to: Community Colleges only.

**Prerequisite(s):** NURS 170 and NURS 180.

**Corequisite(s):** NURS 275 and NURS 283.

**NURS 282 L. Practicum: Management of Client Care****1 Credit**

Organization and delivery of wellness care services for groups of clients based on the nursing process. Restricted to: Community Colleges only.

**Prerequisite(s):** NURS 170, NURS 172, NURS 173L, NURS 180, and NURS 185.

**Corequisite(s):** NURS 284L.

**NURS 283. Pediatric Nursing****4 Credits (2+6P)**

Consists of lecture and associated clinical and laboratory experiences which focus on the care of children from infancy through adolescence including acute and chronic health care problems. Employs nursing process, pathophysiology, pharmacology, and diet therapy through the holistic approach to wellness. Restricted to: Community Colleges only.

**Prerequisite(s):** NURS 170 and NURS 180.

**Corequisite(s):** NURS 275, NURS 280.

**NURS 284 L. Practicum: Preceptorship****3 Credits**

Clinical experience in a leadership role in specific practice areas enhancing the transition from student to practitioner utilizing the holistic approach to wellness. Restricted to: Community Colleges only.

**Prerequisite(s):** NURS 182.

**Corequisite(s):** NURS 282L.

**NURS 285. Holistic Approach to Pharmacotherapeutic Intervention III****1 Credit**

Level III. Holistic approach to the study of basic pharmacology concepts. Includes pharmacodynamic phases of drug interaction. Nursing process is discussed in relation to medication administration. Special emphasis on the role of the nurse and basic concepts related to specific drug categories. Restricted to: Community Colleges only.

**Prerequisite(s):** NURS 185 and NURS 275.

**Corequisite(s):** NURS 270.

**NURS 293. Introduction to Nursing Concepts****3 Credits**

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNEC course no.: NMNEC101. Restricted to: BSN,BSNP,BSNR,NURS majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** Admission to Nursing Program.

**Corequisite(s):** NURS 294,NURS 362.

**NURS 294. Principals of Nursing Practice****4 Credits**

This course introduces the nursing student to the application of concepts through clinical skills in seminar, laboratory, and/or clinical settings.

Principles of communication, assessments, safety, and interventions including accurate calculation, measurement, and administration of medications will be included. Same as NMNEC course no.: NMNEC102.

Restricted to: NURS majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** Admission to the nursing program.

**Corequisite(s):** NURS 293,NURS 362.

**NURS 300. Principles of Professional Nursing Practice****7 Credits (4+6P)**

Focus on the principles, concepts, theories, and terminology central to the study of nursing and its evolution. Uses the nursing process as a framework for providing research-based professional nursing care. Includes clinical component. Restricted to Majors. Restricted to BSN, BSNP, BSNR, NURS majors.

**NURS 302. Foundations of Health Assessment****3 Credits (2+2P)**

Theoretical basis and skills for biopsychosocial assessment of adults. Includes clinical component. Restricted to BSN, BSNP, BSNR, NURS majors.

**NURS 314. Computer Technology for Nurses****3 Credits**

Introduction to health care informatics and its use in nursing practice. Focus includes electronic communication resources, issues and technological applications that support nursing and health care.

**NURS 315. Introduction to Professional Nursing for the R. N.****3 Credits**

Transition course for the R.N. providing an overview of theories and concepts that are the bases for professional nursing practice.

**NURS 322. Nursing Health Assessment****3 Credits**

Theoretical basis for the biopsychosocial assessment of individual patients across the life span for the RN. Restricted to Majors.

**NURS 324. Nursing Care of the Older Adult****3 Credits**

Survey course addressing nursing care provisions for the elderly population in a variety of acute, community and home settings.

**NURS 325. Human Pathophysiology for Nursing****3 Credits**

Concepts of alteration and adaptation in structure and function of the human body across the life span.

**NURS 326. Pharmacology in Clinical Nursing Practice****4 Credits**

Pharmacological concepts and principles and their implications for nursing practice. Includes techniques of dosage calculation for medication and fluid administration. Restricted to BSN, BSNP, BSNR, NURS majors.

**NURS 328. Human Pathophysiology Foundation for Nursing****4 Credits**

Human pathophysiology concepts of adaptation and alteration in function and structure across the life span and their implications for nursing practice. Restricted to: BSN, BSNP, BSNR majors.

**Prerequisite(s):** Grade of C or better in both BIOL 253 and BIOL 254.

**Corequisite(s):** NURS 362,NURS 293,NURS 294.

**NURS 352. Bioterrorism****3 Credits**

Examines the role of today's nurse in the face of real or potential radiological and chemical threats. Emphasis is placed on clinical and public education and safety as well as nursing/logical responses. Taught online.

**NURS 353. Nursing Informatics****3 Credits**

This course addresses nursing informatics principles and practices. Key concepts include relationship with evidence-based nursing practice, use of decision support systems, clinical information systems, telehealth, and standardized nursing language. Restricted to BSNC majors.

**NURS 360. Introduction to Nursing Concepts****3 Credits**

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNEC course no.: NMNEC101 Restricted to: NURS majors.

**Prerequisite(s):** Admission to Nursing Program.

**Corequisite(s):** NURS 361,NURS 362.

**NURS 362. Evidence Based Practice****3 Credits**

The focus of this course is the principles of evidence based nursing practice. It includes the identification of clinical practice problems, the evaluation of available evidence, and the integration of evidence with clinical expertise and patient preferences in application to practice. Same as NMNEC course no.: NMNEC103. Restricted to: NURS majors.

**Prerequisite(s):** Admission to the nursing program.

**Corequisite(s):** NURS 293,NURS 294.

**NURS 372. Adult Health Nursing I****8 Credits (4+8P)**

Theoretical basis for select acute and chronic illnesses related to adults is provided, and critical thinking is used to plan nursing care. Includes clinical component.

**NURS 373. Nursing the Psychiatric-Mental Health Client****5 Credits (3+4P)**

Theoretical and practical knowledge applied to provision of psychiatric-mental health nursing service across the health care continuum. Includes clinical component. Restricted to BSN, BSNR, BSNP, NURS majors.

**NURS 375. Introduction to Nursing Research****3 Credits**

Introduction to scientific inquiry. Evaluation and utilization of nursing research for clinical practice.

**Prerequisite(s):** (STAT/A ST 251G, A ST 311, OR STAT 271G) and (NURS 303, NURS 326, and NURS 328) or consent of instructor.Restricted to BSN, BSNP, BSNR, NURS majors.

**NURS 376. Research and Evidence-Based Practice for the Practicing RN  
3 Credits**

Course provides introduction to evidenced-based practice and research principles for the practicing RN. Evidence-based practice principles and processes are covered. Foundations of research (quantitative and qualitative) research designs and research evaluation are included. Emphasis is placed on ethical and practical issues in critiquing and using research/evidence-based findings. Restricted to BSNC majors.

**Prerequisite(s):** A ST 311, or admission to RN-BSN Option with consent of instructor.

**NURS 377. Health and Illness Concepts I  
3 Credits**

This course will focus on health and illness concepts across the lifespan. Concepts covered are related to homeostasis/regulation, sexuality/reproductive, protection/movement and emotional processes. Same as NMNEC course no.: NMNEC201 Restricted to: NURS majors.

**Prerequisite(s):** NURS 294, NURS 293 & NURS 362.

**Corequisite(s):** NURS 378,NURS 379,NURS 380.

**NURS 378. Health Care Participant  
3 Credits**

This course introduces the nursing student to the attributes of the health care participant as an individual, a family, or a community. Same as NMNEC course no.: NMNEC202. Restricted to: NURS majors.

**Prerequisite(s):** NURS 293, NURS 294 & NURS 362.

**Corequisite(s):** NURS 377,NURS 379,NURS 380.

**NURS 379. Nursing Pharmacology  
3 Credits**

This course introduces the nursing student to pharmacologic nursing practice from a conceptual approach. Same as NMNEC course no.: NMNEC203. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** BIO 253 & BIO 254 OR SPM 271 & SPM 371 OR BIO 225 & Bio 226.

**Corequisite(s):** NURS 328.

**NURS 380. Assessment and Health Promotion  
4 Credits**

This course introduces the nursing student to the assessment of and the health promotion for the health care participant as an individual, a family, or a community. This course uses seminar, laboratory and/or clinical settings. Same as NMNEC course no.: NMNEC204. Restricted to: NURS majors.

**Prerequisite(s):** NURS 293, NURS 294, NURS 362.

**Corequisite(s):** NURS 377,NURS 378,NURS 379.

**NURS 395. Health and Illness Concepts II  
3 Credits**

This course will cover health and illness concepts across the lifespan. Concepts covered are related to oxygenation and hemostasis, homeostasis and regulation, protection and movement, and cognitive and behavioral processes. Same as NMNEC course no.: NMNEC301. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 328, NURS 377, NURS 378, NURS 379, NURS 380.

**Corequisite(s):** NURS 396,NURS 398.

**NURS 396. Professional Nursing Concepts I  
3 Credits**

This course covers foundational concepts for professional development, including selected professional attributes and care competencies. Same as NMNEC course no.: NMNEC302. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 328, NURS 377, NURS 378, NURS 379, NURS 380.

**NURS 397. Special Topics  
1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for at total of 21 credits.

**NURS 398. Care of Patients with Chronic Conditions  
4 Credits**

The focus of this course is to provide safe, evidence-based nursing care for patients with chronic conditions, across the lifespan in a variety of settings. This course builds upon curricular concepts. This course is a combination of lab and clinical. Same as NMNEC course no.: NMNEC303. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 328, NURS 377, NURS 378, NURS 379, NURS 380.

**Corequisite(s):** NURS 395,NURS 396.

**NURS 410. Adult Health Nursing II  
6 Credits (3+6P)**

Focus is on the use of critical thinking to plan nursing care of adults with selected complex illnesses. Clinical component included.

**NURS 415. Parent-Child Nursing  
8 Credits (4+8P)**

Concepts and principles of nursing applied to healthy and ill infants, children, adolescents, and childbearing women within the context of the family. Includes clinical component.

**NURS 416. Older Adult Nursing  
2 Credits**

Introduction to aging, health problems and issues associated with aging. Implications for nursing care of the elderly.

**NURS 420. Community Health Nursing  
3 Credits**

Concepts basic to the nursing care of families, groups, and communities with an emphasis on health promotion, disease prevention, and health maintenance.

**NURS 426. Community Health Nursing for the R.N.: Clinical  
3 Credits**

Nursing process applied to the care of families, groups, and communities.

**NURS 460. Strategies for Student Success  
3 Credits**

This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors.

**NURS 466. Health and Illness Concepts III  
4 Credits**

This course will cover health and illness concepts across the lifespan. Concepts covered are related to hemostasis/regulation, oxygenation/homeostasis, protection/movement, and emotional processes. Same as NMNEC course no.: NMNEC401. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 360, NURS 361, NURS 362.

**Corequisite(s):** NURS 467,NURS 468.

**NURS 467. Clinical Intensive I****4 Credits**

This is the first of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. This course is a combination of seminar, lab, and clinical. Same as NMNEC course no.: NMNEC402.

Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 395, NURS 396, NURS 398.

**Corequisite(s):** NURS 466,NURS 468.

**NURS 468. Clinical Intensive II****4 Credits**

This is the second of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. This course is a combination of seminar, lab, and clinical. Same as NMNEC course no.: NMNEC404.

Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 395, NURS 396, NURS 398.

**Corequisite(s):** NURS 466,NURS 467.

**NURS 470. Nursing Organization and Management****3 Credits**

Concepts of organization and delivery of care to groups of patients based on the nursing process. Emphasis on the roles of the nurse as manager, leader, and change agent within health-care organizations.

**NURS 472. Community and Population Focused Nursing****6 Credits (3+6P)**

Synthesis of nursing, social, and public health science to develop health promotion, disease prevention, and protection strategies for communities and populations. Clinical component included.

**NURS 475. Issues and Trends in Professional Nursing****3 Credits**

Explores the challenges associated with issues and trends in health care and the legal and ethical implications of professional nursing practice.

**NURS 476. Nursing Organization & Management for the R.N.: Clinical****3 Credits**

Nursing process applied to organization, management, and delivery of health care. An integrating experience for the R.N. student designed to facilitate the transition to professional practice. Students work with mentors in a clinical setting to develop professional nursing roles related to leadership and management.

**NURS 477. Nursing Organization and Management for the RN****3 Credits**

Course covers nursing organization, leadership, and management principles, theories, and research for the practicing RN. Restricted to BSNC majors.

**NURS 479. Nursing Care for Complex Patients****8 Credits (2+12P)**

Principles and priorities of nursing care for patients across the life span experiencing complex care problems. Includes integrating experiences designed to facilitate the transition from student to professional nurse. Includes clinical component.

**NURS 486. Concept Synthesis****3 Credits**

This course will focus on the synthesis of curricular concepts in the care of complex patients. Same as NMNEC course no.: NMNEC501. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 466, NURS 467, NURS 468.

**Corequisite(s):** NURS 487,NURS 488,NURS 489.

**NURS 487. Professional Nursing Concepts II****3 Credits**

This course covers policy concepts for professional nursing. Same as NMNEC course no.: NMNEC502. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 466, NURS 467, NURS 468.

**NURS 488. Clinical Intensive III****4 Credits**

The focus of this clinical course is application of the curricular concepts in the management of care participants with complex conditions across the lifespan. This course is a combination of seminar, lab, and clinical. Same as NMNEC course no.: NMNEC503. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** NURS 466, NURS 467, NURS 468.

**Corequisite(s):** NURS 486,NURS 487,NURS 489.

**NURS 489. Capstone****4 Credits**

The synthesis, integration, and application of concepts to professional nursing practice will be applied in the final clinical course to ensure readiness to enter practice. Same as NMNEC course no.: NMNEC504. Restricted to: BSN,BSNP,BSNR,NURS majors.

**Prerequisite(s):** Successful completion of all previous nursing courses.

**Corequisite(s):** NURS 486,NURS 487,NURS 488.

**NURS 490. Independent Study****1-3 Credits**

Individual studies with prior approval of department head.

**NURS 500. Applied Statistics for Evidence-Based Practice****3 Credits**

Provides the logic and appropriate use of statistical techniques most commonly used. Emphasis is based on underlying logic of procedure, the appropriate use of underlying assumptions of procedures, interpretation of results from statistical software and evaluation of published results of the procedures. Statistical software will be used. Restricted to: NURP majors.

**Prerequisite(s):** Admission to DNP Program.

**NURS 505. Theoretical Foundations of Advanced Nursing****3 Credits**

This course is a graduate-level introduction to nursing theory. This course assists students in understanding the nature of theory development in nursing, evidence-based practice and related disciplines. Students examine the definitions and meanings of the basic concepts of theory along with theory development and will explore an analysis of selected theories/models and their application to nursing practice, research, education, and administration.

**Prerequisite(s)/Corequisite(s):** Students must be enrolled in the graduate program in nursing or have the permission of advisor and faculty of course to enroll in course. Restricted to: NURS majors.

**NURS 506. Health Policy for Advanced Nursing Practice****3 Credits**

Course provides a conceptual approach to understanding health policy including the social, legal, political and ethical factors that influence policy development. Strategies for influencing policy direction and change are examined. Restricted to: NURS, NUSC, NURP majors.

**NURS 507. Nursing Research in Evidence-Based Practice****3 Credits**

This course is designed to prepare advanced practice nurses with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice.

**Prerequisite(s)/Corequisite(s):** Students must be enrolled in the graduate program in nursing or have the permission of advisor and faculty to enroll in the course. Restricted to: NURS, NUSC, NURP majors.

**NURS 511. Advanced Pathophysiology for Clinical Nursing****3 Credits**

In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice. Restricted to: NURS, NUSC, NURP majors.

**NURS 512. Advanced Clinical Pharmacology****3 Credits**

Principles of clinical pharmacology for advanced clinical practice. Focus on pharmacology as it relates to human physiology and pathophysiology across the lifespan. Restricted to: NURS, NUSC, NURP majors.

**NURS 514. Psychopharmacology for Advanced Practice****3 Credits**

Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education.

**NURS 515. Advanced Health Assessment****3 Credits (2+1P)**

Assessment theory and skills for advanced clinical practice. Emphasis on assessment of patients across the life span. May be repeated up to 3 credits. Restricted to: NURS, NUSC, NURP majors.

**NURS 518. Genetics and Health****2 Credits**

Assess the impact of emerging genetic technologies on healthcare at the individual, system and population level. Restricted to DNP majors.

**Prerequisite(s):** Admission to DNP Program.

**NURS 530. Promoting Health Behavior****3 Credits**

Emphasis is on the role of the advanced practice nurse in facilitating health behavior change. The impact of health status on health behavior, ethical issues relate to health promotion, and the processes for promoting healthy behaviors are explored. Theoretical models of behavior change and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change.

**NURS 540. Advanced Psychosocial Pathology for Family, Psychiatric-Mental Health Nursing****3 Credits**

In-depth study of psychosocial pathology, factors contributing to psychosocial dysfunction, and diagnostic reasoning basic to advanced-practice psychiatric mental health nursing; emphasis on etiology and differential diagnoses. Restricted to: NURS majors.

**Prerequisite(s):** Admission to the DNP Program.

**NURS 562. Innovations and Health Care Organizations****3 Credits**

Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Taught with NURS 649. Restricted to: NURS, NUSC, NURP majors.

**NURS 563. Human Resource Management in Nursing****3 Credits**

Contemporary approaches to the development and management of nursing resources that complement organizational vision, strategies and management goals. Management of a diverse, quality workforce that results in an improved organizational performance. Performance evaluation, motivation, professional development and legal and regulatory aspects will be explored.

**NURS 564. Nursing Fiscal Management****3 Credits**

Concepts of financial management emphasizing principles of health care budgeting and finance in managing health care resources. A focus is to achieve quality outcomes through financial resource management. May be repeated up to 3 credits. Restricted to: NURS majors.

**NURS 565. Advanced Leadership in Healthcare****3-5 Credits (3+1-2P)**

Analysis of leadership theories as they pertain to the nurse executive and the advanced practice nurse in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Clinical component included for DNP students only. May be repeated up to 5 credits. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** NURS 562.

**NURS 566. Seminar in Nursing Administration- Roles****3 Credits**

Role preparation for the nurse administrator as manager, leader, collaborator and change agent. Synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration.

**Corequisite:** NURS 595.

**NURS 567. Nursing Informatics****3 Credits**

This course provides the foundational knowledge necessary to integrate systems and information technologies. Topics include informatics, knowledge management, healthcare information systems/telehealth including the electronic health record. Focuses on using available technology to enhance safety and monitor the health status and outcomes of populations. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** Consent of Instructor.

**NURS 572. Pharmacology of Addictions****4 Credits**

Concepts and principles of the pharmacology of psychoactive substances and the addiction process; including the pharmacological approach to treatment. Restricted to: NURS majors.

**NURS 574. Oncology Nursing****3 Credits**

This course presents the clinical aspects of cancer diagnosis, the clinical management of major cancers, and their treatment modalities. The course will also focus on supportive therapies for the cancer patient and symptom management.

**Prerequisite(s):** Graduate status or permission of instructor.

**NURS 590. Independent Study****1-10 Credits**

Individual studies and directed research with prior approval of department head. May be repeated on a different topic. May be repeated for a maximum of 20 credits.

**Prerequisite:** consent of instructor.

**NURS 595. Advanced Field Work in Nursing****3 Credits**

Faculty-supervised, independent work in student's advanced practice role. Field work normally taken after the core and designated specialty courses. Minimum of three field-work credits (12 contact hours) required in major area of study. May be repeated for a maximum of 12 credits. May be repeated up to 12 credits. Restricted to: NURS majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** NURS 565.

**Corequisite(s):** NURS 566.

**NURS 597. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a different subject area. May be repeated for a maximum of 8 credits.

**Prerequisite:** consent of instructor.

**NURS 600. Philosophy of Science in Nursing****3 Credits**

Offers a framework for asking both ontological and epistemological questions about knowledge, human science, and nursing science.

**NURS 601. Theory I: Methods and Processes of Nursing Knowledge Development****3 Credits**

Building on the Philosophy of Science course, the student will engage in analysis and critique of both developmental processes and composition of nursing disciplinary knowledge. Diverse approaches will be used to appraise and critique historical and contemporary milestones in the development and evaluation of nursing thought. Emphasis is also placed on implications of theory and knowledge development as related to multicultural and rural issues.

**Prerequisite(s):** NURS 600.

**NURS 602. Theory II: Contemporary Substantive Nursing Knowledge****3 Credits**

Critically examine existing & evolving substantive knowledge drawn from nursing and other disciplines. Focus on the construction, analysis of current substantive nursing knowledge, including evaluation of relationships among theories, evidence and explanation will be pursued. Special attention to existing and evolving theories applicable to rural, multicultural and educational settings. **Prerequisite:** NURS 601

**NURS 606. Quantitative Methods in Nursing Research****3 Credits**

Focus on approaches to developing nursing knowledge by means of quantitative research methods as applied to clinical problems, theoretical modeling of human responses to health and illness, and health policy issues. Emphasizes detailed analysis and critique of non-experimental and experimental designs, issues pertaining to sampling and statistical power, the reliability and validity of measures, and uses and abuses of descriptive and inferential statistics in nursing research literature. Students are expected to develop sufficient discernment to read, critique, evaluate, and discuss the quality, significance, and limitations of published quantitative nursing research.

**Prerequisite:** NURS 621.

**NURS 607. Qualitative Methods in Nursing Research****3 Credits**

Major methodological traditions of qualitative research and their applications to knowledge development and clinical research in nursing are the emphasis. Overview of at least one computer-assisted qualitative data analysis software application. Students will engage in detailed critique and discussion of significant nursing investigation representing various qualitative approaches and traditions.

**NURS 610. Nursing Education: Pedagogy and Roles****3 Credits**

Teaching-learning process in the clinical and classroom settings.

Focuses on educational patterns and pathways in nursing and the roles of faculty in academia. Educational reform is analyzed in relationship to diversity in students, faculty, practice settings and technology-driven learning environments. Instructional designs, teaching strategies, and outcome evaluations are examined for their pedagogic use. The development of critical thinking outcomes, mentorships and partnerships to meet the needs of students are addressed. The course examines issues and challenges that impact the educational process such as student and faculty recruitment, the changing healthcare environment, differentiation of practice, advanced practice, reduced resources and links with theory and research.

**NURS 620. Advanced Health Care Statistics I****3 Credits**

This course provides knowledge, skills and practice in collecting, analyzing and interpreting data. The following quantitative techniques will be examined and utilized using SPSS: principle of measurement, probability, principles of parametric and non parametric techniques, Kolmogorov-Smirnov test, comparison of means, correlation analyses, use of psychometric techniques, binomial test, sign test, McNemar test, median test, Cochran Q test, Phi coefficient, Fisher's Exact test, Mann-Whitney U, Kruskal-Wallis test, Wilcoxon Signed Ranks and Spearman Rho. A graduate level statistics course completed within three years prior to the date of expected admission is desirable. Restricted to majors

**NURS 621. Advanced Health Care Statistics II****3 Credits**

This course is the second of a two-semester quantitative statistical course designed to provide knowledge, skills and practice in collecting, analyzing, and interpreting data. The following quantitative techniques will be examined and utilized using SPSS: analysis of variance (ANOVA), analysis of covariance (ANCOVA), linear, multiple, and logistic regression, structural equation modeling (SEM), principle components analysis, and factor analysis. Restricted to majors.

**Prerequisite:** NURS 620.

**NURS 623. Mixed Methods****3 Credits**

Presents a brief overview of research paradigms with emphasis on formulating research questions, aims and methods for a mixed method/model approach. Students may use proposals developed in earlier qualitative and quantitative research classes to devise mixed method proposal integrating readings on these methods and own research interests. **Prerequisite:** NURS 606 and NURS 607

**NURS 624. Measurement in Culturally Diverse Border Populations  
3 Credits**

The focus of this course is the development of essential competencies required to locate, select, evaluate, and use instruments to operationalize nursing variables. Ethical considerations in nursing research and research issues in diverse populations will be discussed. Specific attention is given to the process of moving from concept to construct, measurement theory, validity/reliability issues, and measurement issues in diverse populations including literacy, social desirability bias, sensitive data, translations, and cultural equivalency. Restricted to PhD in Nursing majors.

**Prerequisite(s):** Admission to PhD in Nursing program; NURS 606; NURS 623; or consent of Instructor.

**NURS 630. Issues in Studying Health of Culturally Diverse and Border Populations  
3 Credits**

Analysis and evaluation of the unique health care needs of culturally diverse and rural populations across the lifespan from ethnic, economic, gender, and sexual orientation perspectives. Interdisciplinary strategies to affect positive health outcomes are discussed, analyzed, and evaluated. Restricted to: NURS, NUSC, NURP majors.

**NURS 631. Population Based Approaches to Health Promotion  
3 Credits**

Population based approaches to health promotion focuses on preparing nursing students to identify, critically analyze and evaluate health promotion initiatives in culturally diverse and border populations using the Southwestern U.S. and U.S./Mexico border as the case exemplar. It examines historical, socio-economic, legal and professional issues associated with health promotion and policy initiatives. It considers prospects for social change, political movements and alternative approaches to develop and hasten adaptation of health promotion initiatives in partnership with communities, advocacy groups and health care agencies.

**NURS 649. Innovations and Health Care Organizations  
3 Credits**

Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Taught with NURS 562. Restricted to: NURS, NUSC, NURP majors.

**NURS 650. Behavioral Approaches and Determinants of Nursing and Health  
3 Credits**

Focuses on how behavioral/mental health concepts are applied in determining health outcomes for individuals, families, and communities. Students will apply and synthesize theoretical constructs within practice and research focusing on behavioral/mental health concepts. Health outcomes are viewed in a traditionally holistic manner in that health outcomes are discussed as an integral part of the human experience of healing and health.

**NURS 651. Applied Nursing Science for the APN  
3 Credits**

Explores the philosophical and scientific underpinnings for nursing knowledge relevant to the role of the doctorate of nursing practice. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** NURS 507.

**NURS 652. Translational Methods and Evidence-Based Practice  
3 Credits**

Designed to prepare DNP student to demonstrate advanced levels of clinical judgment, systems thinking, and accountability in design, delivery, and evaluating evidence based on care to improve patient outcomes. Translate evidence into their specialty practice environment. Restricted to: NURS, NUSC, NURP majors.

**Prerequisite(s):** NURS 651.

**NURS 658. The Aging Adult  
3 Credits**

This course focuses on the care and management of older adults and their families. Content is directed at assessment and management of acute and chronic presentations of illness and complex, multiple health problems across the health care continuum. It will include examination of the psycho-socio-cultural processes which influence the behavioral patterns, coping, and adaptation of older adults. Restricted to DNP majors.

**Prerequisite(s):** Admission to DNP program.

**NURS 659. Addictive Disorders  
4 Credits**

Focus on care of the individual with addictive disorders. The impact on the individual as well as the community will be examined. Advanced practice nursing interventions based on theoretical and research based knowledge of addictions will be addressed. The pharmacology of psychoactive substances, the addiction process, and pharmacological approach to treatment will be included. Treatment of addictive disorders and their relevance to culturally diverse clientele with a variety of lifestyles will be evaluated. Restricted to: NURP majors.

**Prerequisite(s):** Admission to DNP program.

**NURS 660. Family, Psychiatric Mental Health Nursing I  
6 Credits (3+1-3P)**

This course provides the family psychiatric nurse practitioner student with advanced theoretical knowledge and practice in individual therapies, comprehensive psychiatric evaluation, personality development concepts, dual diagnoses and psychotherapy principles; including management of health promotion, health maintenance and disease prevention activities. Emphasis will be placed on individuals across the lifespan in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 6 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 511, NURS 512, NURS 515.

**NURS 662. Family, Psychiatric-Mental Health Nursing II  
5-7 Credits (3+2-4P)**

This course provides further knowledge and skills for the family psychiatric nurse practitioner student in the conceptual framework and practice of psychotherapy in a variety of settings. Emphasis is placed on work with individuals and families and groups across the lifespan in a multicultural environment to help manage their acute and chronic mental illnesses, including, dual diagnosis, psychopathology and psychopharmacology. Advanced practice nurses in the certificate program will have varying hours of credit. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 7 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 660.

**NURS 664. Family, Psychiatric Mental Health Nursing III  
5 Credits (1+3-4P)**

This course provides further knowledge and skills for the family psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment. Emphasis will be placed on individuals, families and groups across the lifespan in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 5 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 662.

**NURS 670. Diagnostic Reasoning  
3 Credits (2+4P)**

This course is designed to develop advanced knowledge of differential diagnosis based upon physical and mental assessment of clients/patients across the lifespan in a variety of clinical settings. Students apply, synthesize, and integrate advanced clinical problem solving and reasoning to determine differential nursing and medical diagnoses, interpret and apply laboratory and diagnostic techniques to determine a final judgment and diagnosis. Restricted to DNP majors.

**NURS 671. Primary Care I  
6 Credits (3+1-3P)**

This course provides the nurse practitioner student with advanced theoretical knowledge and practice in the assessment and management of health promotion, health maintenance and disease prevention activities across the lifespan; including the assessment and management of common acute and chronic health concerns. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 6 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 511, NURS 512, NURS 515.

**NURS 672. Primary Care II  
5-7 Credits (3+2-4P)**

The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common (variable clinical credit for certificate program students)chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. Advanced practice nurses in the certificate program will have varying hours of credit. May be repeated up to 7 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 671.

**NURS 673. Primary Care III  
5 Credits (1+3-4P)**

The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common acute and chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. Advanced practice nurses in the certificate program will have varied clinical credit hours to complete. May be repeated up to 5 credits. Restricted to: NURP,NURS,NUSC majors.

**Prerequisite(s):** NURS 672.

**NURS 676. Women's Health  
3 Credits**

The course will examine patient and family perspectives as well as health care system variables and societal issues that affect the organization and delivery of women's health care. Students will engage in critical analysis of the evidence base concerning psychosocial and spiritual concerns and barriers to and opportunities for improving women's health care across the diverse settings in which health care is delivered. Focus on evidence-based approaches to the primary care management of women. May be repeated up to 3 credits.

**NURS 678. Health Needs of Special Populations  
2-4 Credits (2+1-2P)**

This course provides an overview of infant, child, adult and older adult health needs and interventions that promote and support optimal health. The conceptual and theoretical foundation for advanced practice with individuals and families across the lifespan is emphasized, including pharmaco-therapeutic and integrated bio-psychosocial interventions for diverse populations across the continuum of care. Advanced practice nurses in the certificate program will have varying hours of credit. May be repeated up to 4 credits.

**Prerequisite(s):** NURS 671, NURS 672, NURS 673, NURS 660, NURS 662, NURS 664.

**NURS 684. Lifestyle Change and Adherence Issues with Diverse Populations  
3 Credits**

Includes the critical examination of selected theories of health behavior on life style choices and adherence issues with diverse populations within the community setting. Emphasis is given to the analysis of health behavior in regard to planning, development, and evaluation of population based health programs. Restricted to DNP majors.

**NURS 685. Epidemiology for Advanced Nursing Practice  
2 Credits**

Emphasis is on the practical application of the principles of epidemiology in the measurement and evaluation of population health. Epidemiological literature will be critiqued and synthesized to evaluate population-based public health nursing problems. Issues related to disease surveillance, causation, genetic patterns, screening and social trends in population health will be examined. Use of existing data bases and technology programs are covered. Restricted to: NURP,NURS, NUSC majors.

**NURS 690. Doctoral Nursing Seminar  
1-3 Credits (1-3)**

Seminar to build nursing scholarship skills,consisting of a series of 1 credit seminars that are taken as part of the doctoral degree plan. May be repeated up to 7 credits. Restricted to: NUSC majors.

**NURS 691. Independent Study  
1-6 Credits (1-6)**

Individual studies and directed research with prior approval of department head. May be repeated for a maximum of 12 credits.  
**Prerequisite:** consent of instructor.

**NURS 697. Professional Roles for Advanced Practice Clinical Nursing  
3 Credits**

This course will focus on providing an in depth understanding of the legal, historical, political, social, and ethical aspects of advanced practice nursing. Traditional and emerging roles for advanced practice nursing are examined. Restricted to DNP majors.

**Prerequisite(s):** Admission to DNP program, NURS 664 OR NURS 672.

**NURS 698. Advanced Practice Nursing Immersion****1-4 Credits (1-4)**

Practicum experience for advanced practice students. Focus will be on a practice issue chosen by the student for further development as an evidence-based doctoral project. Clinical practice hours as needed to meet DNP requirements. Up to 24 credits may be completed by student. May be repeated up to 4 credits. Restricted to: NURP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** NURS 511, NURS 512, NURS 515 or enrollment in post-masters track.

**NURS 699. Clinical Scholarly Project****1-4 Credits (1-4)**

Building on the practice expertise of the DNP student, this series of credits is to provide the student with the opportunity to design an innovative clinical practice improvement project/program addressing an actual health care concern. Through mentored activities, the DNP student will identify, develop, implement, evaluate, and disseminate an independent analytic. Graded: S/U. NURS 652. Restricted to: NURP majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Admission to DNP program.

**NURS 700. Doctoral Dissertation****1-9 Credits (1-9)**

Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits.

**NURS 999. Practical Nursing Requirements Completed****99 Credits**

A phantom course created to indicate a student has met Practical Nursing requirements. Used to indicate this in academic history to replace an administrative message not converted from SOLAR to VISTAS. 01/97

## OEBM-BIOMEDICAL TECHNOLOGY (OEBM)

**OEBM 140. Applied Human Biology for Biomedical Technology****3 Credits**

Essential human biology, anatomy, physiology and medical terminology for biomedical equipment technicians. Focus on the vocabulary necessary for effective communication in the hospital environment as part of the health care team. Restricted to: Community Colleges only.

**OEBM 141. Medical Electronics and Safety in Healthcare****3 Credits**

Introduction to the biomedical equipment technology field. Operation of common biomedical equipment to include pressure and temperature systems, infusion devices, patient monitors, and other physiologic and patient systems. Hospital safety and health regulations explained. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEBM 140.

**OEBM 200. Biomedical Internship****3 Credits**

Practice working in industry as a biomedical electronics technologist. Students work on a variety of medical equipment and job tasks. An employer evaluation, student report, and a minimum of 100 work hours are required. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEBM 140 and OEBM 141.

**OEBM 210. Biomedical Clinical****4 Credits (1+9P)**

Clinical experiences to include advanced biomedical equipment maintenance, inventory control, and medical facility and industry standards. Restricted to Biomedical majors.

**Prerequisite(s):** OEBM 200.

**OEBM 211. CBET Exam Preparation****1 Credit**

An overview of the Certified Biomedical Equipment Technician exam. Topics include anatomy and physiology, electronics principles, safety issues, equipment operation, and equipment troubleshooting.

**Prerequisite(s)/Corequisite(s):** OEBM 241 AND OEBM 240. Restricted to Community Colleges campuses only.

**OEBM 240. Medical Imaging Systems****3 Credits**

The fundamentals of diagnostic radiography equipment will be explored. Principles of an x-ray system will be explained including the x-ray generation, image formation and film processing. Focus will be on both safety and quality. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEBM 140.

**OEBM 241. Advanced Medical Electronics****3 Credits (3+1P)**

Advanced study in biomedical equipment to include cardiovascular, pulmonary, telemetry and other critical life support systems. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEBM 141.

## OECS-COMPUTER TECHNOLOGY (OECS)

**OECS 101. Computer Basics****1 Credit**

Hands-on instruction to introduce computer use and commonly used software. Graded S/U.

**OECS 105. Introduction to Information Technology****3 Credits**

Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communication, data analysis, information management and decision-making. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**OECS 110. Introduction to Power Point****1-3 Credits (1-3)**

An introduction to Power Point software to develop business presentations. Includes concepts of basic presentation methods and graphic design principles. Students will create and deliver presentations using text, charts, digitized images, and sound. Restricted to Community Colleges campuses only.

**OECS 125. Operating Systems****1-3 Credits**

Installation, configuration and optimization of current operating systems. Restricted to: Community Colleges only.

**OECS 128. Operating Systems Linux/Unix****3 Credits**

Installation, configuration, and use of Linux/Unix operating system software and utilities including hardware management, file management, use of command line, and scripting. Restricted to: Community Colleges only.

**OECS 140. Introduction to Game Production Industry****1-3 Credits (1-3)**

Students explore the business behind game production, understanding how game companies are organized and funded, positions within the game industry, and what skills game producers need. Restricted to Community Colleges campuses only.

**OECS 141. Introduction to Interactive Game Programming****1-3 Credits (1-3)**

This introductory programming class reviews the basics of programming, including the object-oriented approach. Students will de-construct existing games, develop their own code, and gain an appreciation for coding strategies. May be repeated for a maximum of 6 credits. Restricted to Community Colleges campuses only.

**OECS 145. Mobile Application Development****1-3 Credits (1-3)**

Introduction to elements of mobile application coding including concepts, design strategies, tools needed to create, test and deploy applications for mobile devices. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**OECS 150. Visual Basic Programming****3-4 Credits (3-4)**

Introduction to algorithmic problem-solving concepts, structured programming design-oriented application programming interface development. Solutions to problems are implemented using the Visual Basic programming language in the Windows environment, with connection to Access databases as applicable.

**Prerequisite(s)/Corequisite(s):** OECS 220. Restricted to Community Colleges campuses only.

**OECS 155. Special Topics - Introductory Computer Technology****0.5-4 Credits (.5-4)**

Topics to be announced in the Schedule of Classes. May be repeated up to 8 credits.

**OECS 185. PC Maintenance and Repair I****1-3 Credits**

Introduction to most common types of PC configurations, installations, and failures. This course will explore troubleshooting skills for maintaining and repairing common hardware and software related problems. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**OECS 192. C++ Programming I****3 Credits**

Development of skills in programming using the C++ programming language. Restricted to: Community Colleges only.

**OECS 195. Java Programming I****1-3 Credits**

Developing of skills in programming using the Java programming language. Restricted to: Community Colleges only.

**OECS 200. Accounting on Microcomputers****3 Credits**

Fundamental accounting principles using popular microcomputer software to include G/L, A/R, A/P, purchase order, billing, inventory, and forecasting modules.

**Prerequisite:** ACCT 221 or BOT 121.

**OECS 203. UNIX Operating System****1-3 Credits**

Introduction to the UNIX operating system using Telnet to access a remote UNIX system. Basic UNIX commands and file system concepts.

**Prerequisite:** C S 110, BCIS 110 or OECS 105.

**OECS 204. Linux Operating System****1-3 Credits**

Install and configure the Linux operating system on X86 systems. Covers issues involved in maintaining operating system, networking, creating and managing users, and installing and updating software. General procedures for working with operating system includes maintaining disk space, preserving system security, and other related topics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**OECS 205. Advanced Operating Systems: Administration****3 Credits**

Examines operating systems designed for PC, minicomputers and mainframes. Covers maintaining operating systems, creating and managing users, and installing and updating software. General procedures for working with operating systems will include maintaining disk space, preserving system security, providing mail services, among other topics. May be repeated for a maximum of 6 credits.

**Prerequisite:** OECS 128.

**OECS 207. Windows****0.5-3 Credits**

Covers local installation, configuration of core local services, managing users, and the general local management and maintenance of Windows workstations. May be repeated up to 6 credits.

**Prerequisite(s)/Corequisite(s):** OECS 185. Prerequisite(s): . Restricted to Community Colleges campuses only.

**OECS 208. Internet Applications****1-3 Credits**

Survey of the Internet to include e-mail, file transfer, current search techniques, the World Wide Web and basic Web page development. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**OECS 209. Computer Graphic Arts****1-3 Credits**

Basic graphics composition using computer programs to include editing and manipulating graphic images, clip-art, and printing of pictures. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes.

**Prerequisite:** OECS 105, C S 110, or OECS 101.

**OECS 211. Word Processing Applications****1-3 Credits**

Basic word processing to include composing, editing, formatting, and printing of documents. May be repeated under different subtitles listed in the Schedule of Classes for a maximum of 6 credits.

**Prerequisites:** C S 110, BCIS 110 or OECS 105.

**OECS 213. Image Processing****1 Credit**

Introduction to digital imaging acquisition and editing. Use of digital cameras and computer graphic software for business and personal use. Graded S/U.

**Prerequisites:** C S 110, BCIS 110 or OECS 105.

**OECS 214. Creating a Web Page****1 Credit**

Introduction to creating Web pages for business and personal use. Graded S/U.

**Prerequisites:** C S 110, BCIS 110 or OECS 105.

**OECS 215. Spreadsheet Applications****1-3 Credits**

Use of spreadsheets to include graphics and business applications. May be repeated for a maximum of 6 credits.

**Prerequisite(s):** C S 110, BCIS 110 or OECS 105.

**OECS 216. Programming for the Web****3 Credits**

Designing web-based applications using appropriate programming language(s) such as, but not limited to HTML, PHP, MySQL, SQL, Java, Perl, C or C++. May be repeated up to 6 credits. Restricted to: Community Colleges only.

**Prerequisite(s):** One semester of any programming course.

**OECS 220. Database Application and Design****1-3 Credits**

Creating, sorting, and searching of single and multifile databases to include report generation and programming database commands. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes. Restricted to: Community Colleges only.

**Prerequisite(s):** C S 110 OR BCIS 110 OR E T 120 OR E T 122 OR OECS 105.

**OECS 221. Internship I****1-3 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**Prerequisite(s):** Consent of instructor.

**OECS 222. Internship II****1-3 Credits**

Continuation of OECS 221. Each credit requires specified number of hours of on-the-job work experience. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 221 and consent of instructor.

**OECS 227. Computer Applications for Technicians****3 Credits**

Computer applications for service technicians in various disciplines. Hardware and software applications explored. Includes operating systems, high level programming, and networking hardware and software.

**OECS 230. Data Communications and Networks I****1-3 Credits**

Definition of data communication; survey of hardware applications and teleprocessor software; examination and design of networks. May be repeated for a maximum of 6 credits.

**Prerequisite:** OECS 185.

**OECS 231. Data Communications and Networks II****1-3 Credits**

Installation and application of popular microcomputer network software. May be repeated for a maximum of 6 credits.

**Prerequisite:** OECS 230.

**OECS 232. Implementing and Supporting Networks I****3 Credits**

Knowledge and skills relating to post-installation and day-to-day administration tasks in a single-domain or multiple-domain network.

**Prerequisite:** OECS 230 or OECS 261.

**OECS 234. Linux Server****3 Credits**

This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Linux Server(s). It provides in-depth, hands-on training for planning, implementation, management and support of Linux networking services. May be repeated up to 6 credits.

**Prerequisite(s):** OECS 128, OECS 203 or OECS 204.

**OECS 235. Structured Query Language (SQL)****1-3 Credits**

Installation, configuration, administration, and troubleshooting of SQL client/server database management system. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** OECS 220. Restricted to Community Colleges campuses only.

**OECS 237. Windows Server****3 Credits**

This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Microsoft Windows Server Active Directory Domain Services in medium to large businesses. It provides in-depth, hands-on training for Information Technology (IT) professionals responsible for the planning, implementation, management, and support of Windows Active Directory services. Restricted to:

Community Colleges only.

**Prerequisite(s):** OECS 207.

**OECS 245. Game Programming I****3 Credits**

Development of programming skills for games and animation using current programming languages and tools. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**OECS 246. Game Programming II****3 Credits**

Continuation of OECS 245. May be repeated for a maximum of 6 credits.

**Prerequisite:** OECS 245.

**OECS 250. Systems Analysis and Design I****3 Credits**

Analysis, configuration, design and testing of organizations' work flow as it relates to hardware, software, data, procedures and personnel. Systems Life Cycle approach matching end users' needs to feasible financial, technical and operational solutions. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 220.

**OECS 255. Special Topics****1-4 Credits**

Topics to be announced in the Schedule of Classes.

**OECS 260. Hypertext Markup Language (HTML)****1-3 Credits**

Coverage of HTML as used for web-page development for Internet and Intranet. Text manipulation, graphics, hypertext links, lists, and tables.

May be repeated for a maximum of 3 credits.

**Prerequisite:** C S 110, BCIS 110 or OECS 105.

**OECS 261. Introduction to Networks****3-4 Credits (3-4)**

Introduction to networking principles including the practical and conceptual skills for understanding basic networking, planning and designing networks, implementing IP addressing schemes, examining the OSI and TCP/IP layers, and performing basic configurations for routers and switches. Aligns to the first course of the Cisco Networking Academy CCNA curriculum. Restricted to Community Colleges campuses only.

**OECS 262. Essentials of Routing and Switching****3-4 Credits (3-4)**

Examination of the architecture, components, and operations of routers and switches in a small network. Student will learn how to configure, verify and troubleshoot: routers and switches, static routing, default routing, VLANs, and ACLs. Aligns to the second course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 261.

**OECS 263. Network Fundamentals****3-4 Credits (3-4)**

Fundamentals of networking architecture, components, and operations including practical and conceptual skills using routers and switches. Student will learn how to configure, verify and troubleshoot static routing, default routing, VLANs, and ACLs. This course aligns to the third course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 262.

**OECS 264. Network Routing Protocols****3-4 Credits (3-4)**

Fundamentals of routing protocols for troubleshooting advanced network operations. Covers common networking issues such as RIP, OSPF, and EIGRP for IPv4 and IPv6 networks. This course aligns to the fourth course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 263.

**OECS 269. Network Security****3-4 Credits (3-4)**

Fundamentals of design and implementation of network security solutions that will reduce the risk of system vulnerability. May be repeated up to 8 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 204 or OECS 207 or OECS 261 or consent of instructor.

**OECS 275. PC Maintenance and Repair II****1-3 Credits**

Continuation of OECS 185. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OECS 185.

**OECS 280. Desktop Publishing I****3 Credits**

Design and production of publication materials to fill the needs of business communities, using a microcomputer. May be repeated for a maximum of 6 credits. Same as BOT 280.

**Prerequisites:** either BCIS 110, C S 110, OECS 105.

**OECS 290. Computer Technology Capstone****1-3 Credits**

Refines skills learned in the OECS program. Culminates in a review and practice of advanced software applications. May be repeated up to 3 credits. Restricted to: OECS & OECT majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** (OECS 125, OECS 128, OECS 207, OR OECS 203) AND (OECS 185 OR E T 283).

**OECS 299. Independent Study****1-3 Credits**

Specific subjects to be determined based on need. DAS Occupational Education, Dental Assisting. Restricted to: Community Colleges only.

## OEEM- PARAMEDIC (OEEM)

**OEEM 101. CPR for the Health Care Professional****1 Credit**

Students learn identification and response to airway and circulation emergencies, including use of a SAED and accessing the EMS system. This course is taught using the American Heart Association guidelines for course completion. Required: grade of C or better.

**OEEM 103. Heartsaver First Aid/CPR****1 Credit**

Students learn how to identify and respond to airway, circulation and basic first aid emergencies, to include using a SAED and accessing the EMS system. This course is intended for students who are not Allied Health Majors and utilizes the American Heart Association guidelines for course completion. Restricted to: Community Colleges only.

**OEEM 106. Advanced First Aid****2 Credits**

Theory and advanced first aid skills taught emphasizing recognition and providing care for injury or sudden illness until professional medical help arrives. Course meets and/or exceeds the Red Cross or National Safety Council standards.

**Corequisite:** OEEM 101 or consent of instructor.

**OEEM 115. First Responder Prehospital Professional****3 Credits (2+3P)**

Provides training in prehospital medical and traumatic emergencies. Requires a C or better to pass. Restricted to majors.

**Prerequisite:** consent of instructor.

**Corequisite:** OEEM 101.

**OEEM 116. Emergency Medical Technician Bridge****5 Credits (3+6P)**

Enhanced skill instruction and didactic integration designed to meet the requirements for an EMT-Basic certificate. Requires a "C" or better to pass. May be repeated up to 5 credits. Consent of Instructor required.

**Corequisite(s):** OEEM 121.

**Prerequisite(s)/Corequisite(s):** OEEM 153. Prerequisite(s): OEEM 101, OEEM 115. Restricted to: OEMS,OEEM majors. Restricted to Community Colleges campuses only.

**OEEM 120. Emergency Medical Technician Basic****6 Credits**

EMT-Basic skills to include care of soft tissue and muscular/skeletal injuries, circulatory, nervous, general medical and respiratory emergencies. Requires a "C" or better to pass. May be repeated up to 6 credits. Consent of Instructor required.

**Corequisite(s):** OEEM 101,OEEM 120L,OEEM 121.

**Prerequisite(s)/Corequisite(s):** OEEM 153. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

**OEEEM 120 L. Emergency Medical Technician Basic Lab****2 Credits**

EMT-Basic skills development with emphasis on assessment, skills competency and team-work in patient care in the prehospital setting. May be repeated up to 2 credits.

**Corequisite(s):** OEEEM 101, OEEEM 120, OEEEM 121.

**Prerequisite(s)/Corequisite(s):** OEEEM 153. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**OEEEM 121. Emergency Medical Technician Basic Field/Clinical****1 Credit**

Covers the patient care experience provided through assigned shifts in the hospital and/or ambulance setting. Requires a "C" or better to pass. May be repeated up to 1 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** OEEEM 101, OEEEM 120, OEEEM 120L OEEEM 153. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**OEEEM 122. Emergency Medical Technician Basic Advanced Field/ Internship****2 Credits**

Expanded patient care experience provided through assigned shifts in the hospital and/or ambulance setting. May be repeated up to 2 credits. Consent of Instructor required. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Current EMT-basic license and consent of instructor.

**OEEEM 150. Emergency Medical Technician Intermediate****5 Credits**

Theory of the roles, responsibilities and scope of practice of the EMT-Intermediate. Assessment and management of respiratory, cardiac, trauma, environmental, behavior, reproduction, and childhood emergencies. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Current EMT-basic license, pretest and consent of instructor.

**OEEEM 150 L. Emergency Medical Technician Intermediate Lab****2 Credits**

EMT-Intermediate skills development with an emphasis on assessment, skills competency, and team work in patient care in the prehospital setting. Requires a C or better to pass.

**Prerequisite(s)/Corequisite(s):** OEEEM 150, OEEEM 151. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**OEEEM 151. Emergency Medical Technician Intermediate Field/Clinical****2 Credits**

Patient care experience provided through assigned shifts in the hospital and/or ambulance setting.

**Prerequisite(s)/Corequisite(s):** OEEEM 150, OEEEM 150 L. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**OEEEM 153. Introduction to Anatomy and Physiology for the EMS Provider****3 Credits**

To properly assess and manage a patient, a prehospital provider must have a solid foundation in human anatomy and physiology. This course provides a systematic approach to building this foundation. Grade of "C" or better is required to pass the course. Consent of Instructor required. Restricted to Community Colleges campuses only.

**OEEEM 155. Special Topics****1-6 Credits**

Specific topics to be listed in Schedule of Classes. May be repeated for a maximum of 10 credits.

**OEEEM 158. Emergency Medical Technician-Combination Refresher****2 Credits**

A comprehensive review of prehospital medicine for the prehospital care provider from the first responder level through the EMT Intermediate. New material relevant to recertification of the New Mexico First Responder, EMT Basic and EMT Intermediate licensure included. Graded S/U.

**OEEEM 177. Emergency Medical Services Instructor****4 Credits**

Theory of student learning, methodology, instructional components, evaluation, and course coordination for the EMS profession. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Minimum of an EMT-Basic License required.

**OEEEM 201. Human Pathophysiology****3 Credits (2+3P)**

Overview of anatomy and physiology. Emphasis on human body pathophysiology including a medical illness component. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEEM 120, OEEEM 120 L.

**OEEEM 202. EMT-Paramedic Respiratory Emergencies****3 Credits (2+3P)**

Review anatomy, physiology and pathophysiology of the respiratory system. Assessment and management of respiratory emergencies and acute respiratory failure in the prehospital setting. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEEM 212.

**OEEEM 203. EMT-Paramedic Trauma Emergencies****3 Credits (2+3P)**

Study of the effects of trauma on the human body. Assessment and management of trauma patients and scenes, including vehicular extrication. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEEM 216.

**OEEEM 206. Introduction to Advanced Prehospital Care****3 Credits (2+3P)**

Overview of prehospital care including roles and responsibilities of EMT-P, EMS systems, medical, legal, ethical issues, stress management, medical terminology, medical report writing and communication. Includes ride-along with ambulance and dispatch observation. Requires a C or better to pass. Restricted to majors. Consent of instructor required. Restricted to: Community Colleges only. Restricted to OEEEM majors.

**Prerequisite(s):** OEEEM 120.

**OEEEM 207. Introduction to Pharmacology****3 Credits (2+3P)**

Drug actions, factors modifying drugs and dosages: characteristics of drug effects, and drug history and dosages. Prehospital protocol, transport, and common patient prescription medications. Restricted to majors. Requires a C or better to pass. Restricted to: Community Colleges only. Restricted to OEEEM majors.

**Prerequisite(s):** OEEEM 120.

**OEEM 210. Cardiac Rhythm Interpretation****3 Credits (2+3P)**

Cardiac conduction system: electrophysiology, electrocardiogram, monitor, atrial, sinus, ventricular and junctional dysrhythmias, multiple lead EKG and 12 lead EKG interpretation. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEM, OEMS majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEM 201, OEEM 206, OEEM 207.

**OEEM 212. EMT-Paramedic Cardiovascular Emergencies****3 Credits (2+3P)**

Review anatomy, physiology, and pathophysiology of cardiovascular system. Assessment and management of cardiovascular emergencies in the prehospital setting. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEM 210.

**OEEM 213. EMT-Paramedic: Medical Emergencies I****3 Credits (2+3P)**

Study of the disease process; assessment and management of neurological, endocrine, gastrointestinal, renal emergencies and infectious disease. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEM, OEMS majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEM 212.

**OEEM 214. EMT--Paramedic: Medical Environmental Emergencies II****3 Credits (2+3P)**

Study of disease process, assessment, and management of poisoning, drug and alcohol abuse, environmental, behavioral and geriatric emergencies. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEM 213.

**OEEM 216. EMT-Paramedic: Reproductive and Childhood Emergencies****3 Credits (2+3P)**

Covers anatomy, physiology, disease processes, assessment and management of male and female reproductive system emergencies, childhood emergencies and growth and development. Restricted to majors. Requires a C or better to pass. Restricted to: Community Colleges only.

**Prerequisite(s):** OEEM 214 and consent of instructor.

**OEEM 218. Pediatric Advance Life Support for the Healthcare Professional****1 Credit**

Identify and respond to life threatening pediatric emergencies. Taught using the American Heart Association guidelines for course completion. Graded S/U.

**Prerequisite:** OEEM 101.

**OEEM 219. Advance Cardiac Life Support for the Healthcare Provider****1 Credit**

Identify and respond to life threatening cardiac emergencies. Taught using the American Heart Association guidelines for course completion. Graded S/U.

**Prerequisite:** OEEM 101.

**OEEM 230. EMT-Paramedic Clinical Experience I****3 Credits**

Assigned clinical experiences in patient assessment and specific management techniques. Successful completion includes minimum required hours and completion of course objectives. Restricted to majors. Requires a C or better to pass.

**Prerequisite:** consent of instructor.

**OEEM 231. EMT-Paramedic Clinical Experience II****3 Credits**

Assigned clinical experiences in patient assessment and specific management techniques. Successful completion includes minimum required hours and completion of course objectives. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** OEEM 230. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

**OEEM 240. EMT-Paramedic Field Experience I****3 Credits**

Advanced prehospital skills and knowledge. Successful completion of at least the minimum required hours and course objectives. Restricted to majors. Requires a C or better to pass.

**Prerequisite:** consent of instructor.

**OEEM 241. EMT-Paramedic Field Experience II****3 Credits**

Continued focus on advanced prehospital skills and knowledge, with increasing responsibility for patient care. Successful completion includes meeting at least the minimum required hours and course objectives. Pre/ Requires a C- or better to pass.

**Corequisites:** OEEM 240 Restricted to majors.

**OEEM 242. EMT-Paramedic Field Internship****3 Credits**

Emphasis on total patient care responsibility and team leadership skills. Successful completion includes meeting the minimum hours required and course objectives. Pre/ Consent of Instructor required. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEM 231, OEEM 241.

**OEEM 243. EMT-Paramedic Preparation for Practice****2 Credits**

Comprehensive final program testing to prepare for licensing examination. Requires a "C" or better to pass. May be repeated up to 2 credits. Consent of Instructor required. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OEEM 242.

**OEEM 247. Emergency Medical Technician - Paramedic Refresher****2 Credits (1+3P)**

A comprehensive review of prehospital emergency medicine for the EMT Paramedic. New material relevant to recertification of the New Mexico and Nationally Registered Paramedic licensure. Graded S/U.

**OEEM 253. Critical Care Emergency Medical Transport Program****6 Credits (5+6P)**

This course will provide further education to Paramedics, Registered Nurses and Registered Respiratory Therapists who wish to function as part of a critical care transport team. Consent of instructor required. Restricted to: Community Colleges only.

**Prerequisite(s):** Licensed Paramedic, Registered Nurse or Registered Respiratory Therapist with one or more years experience.

## OEET- ELECTRICAL TRADES (OEET)

### OEET 110. Basic Electricity and Electronics

#### 4 Credits (3+3P)

An introduction to electricity theory and practice, including electron theory, Ohm's law, construction of electrical circuits, direct and alternating currents, magnetism, transformers, and practical applications. Same as HVAC 102, ELT 105, OEPB 102.

### OEET 112. Math Study Skills for Electrical

#### 1 Credit

Covers specific math study skills and critical thinking processes to reinforce practical uses of math relating to electrical apprenticeship applications. The student will be introduced to electrical mathematical formulas during the problem-solving steps required for electrical circuit design and analysis. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** OEET 151 OR OEET 152. Restricted to: Community Colleges only.

### OEET 115. Wiring Methods and Materials

#### 5 Credits (2+6P)

Application of electrical code in selection of wiring materials; proper methods of installation.

**Corequisite:** OEET 110 or consent of instructor.

### OEET 120. Basic Motor Controls

#### 5 Credits (2+6P)

Developing schematics and wiring simple manual and electromechanical control devices.

**Prerequisite:** OEET 110 or consent of instructor.

### OEET 130. Introduction to Electrical Power Systems

#### 2 Credits

An overview of electrical power systems, equipment, safety practices, first aid and CPR. Restricted to majors.

**Prerequisite:** acceptance into the electrical lineworker program.

**Corequisite:** OEET 110 and OEET 131.

### OEET 131. Electrical Lineworker Lab I

#### 6 Credits

Climbing and work on utility poles using ropes and rigging, pole setting and an introduction to transmission and distribution line construction.

Maintenance and troubleshooting to include the use of hot sticks.

Restricted to majors.

**Prerequisite:** acceptance into the electrical lineworker program.

**Corequisite:** OEET 110 and OEET 130.

### OEET 140. Electrical Power Systems II

#### 3 Credits (2+2P)

Theory of power generation and distribution with emphasis on three phase systems to include transformers, voltage regulators, surge arrestors. Includes troubleshooting. Restricted to majors.

**Prerequisites:** acceptance into the electrical lineworker program and OEET 130.

**Corequisite:** OEET 141.

### OEET 141. Electrical Lineworker II

#### 6 Credits

Practice in the installation of electrical power lines including transformers, voltage regulators, and surge arrestors. Also advanced hot sticking procedures, troubleshooting, underground systems procedures, and pole-top rescue. Restricted to: Community Colleges only.

**Prerequisites:** Acceptance into the lineworker program and OEET 131.

**Corequisite:** OEET 140.

### OEET 151. Electrical Apprenticeship I

#### 6 Credits

Apprenticeship responsibilities and benefits as well as first aid and CPR will be covered. Hand tools, electrical theory, and the regulations imposed by national codes and OSHA. Students will apply theory taught in their jobs.

**Prerequisite:** consent of instructor.

### OEET 152. Electrical Apprenticeship II

#### 6 Credits

Ohm's law circuit sizing and service panel sizing will be covered in detail. Other topics include low voltage systems, heating and air conditioning circuits, alarm systems and smoke detectors.

**Prerequisites:** OEET 151 and consent of instructor.

### OEET 153. Electrical Apprenticeship III

#### 6 Credits

Various electrical measuring devices will be covered in detail. Inductance, transformers, capacitance, and simple motors will be studied.

**Prerequisites:** OEET 152 and consent of instructor.

### OEET 154. Electrical Apprenticeship IV

#### 6 Credits

Theory and application of three-phase transformers and autotransformers. Electrical distribution using switchboards, panelboards, and circuit breakers.

**Prerequisites:** OEET 153 and consent of instructor.

### OEET 205. National Electric Code

#### 3 Credits

Interpretation and application of the National Electric Code.

**Prerequisite:** OEET 110.

### OEET 210. Intermediate Electricity

#### 5 Credits (3+4P)

Introduction to inductance, capacitance, reactances, and power factor correction.

**Prerequisite:** OEET 110.

### OEET 221. Cooperative Experience I

#### 1-4 Credits

Supervised cooperative work program. Student is employed in an approved occupation and is supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

**Prerequisite:** consent of instructor.

### OEET 251. Electrical Apprenticeship V

#### 6 Credits

Commercial/industrial applications for electricians. Blueprint interpretation, commercial construction types and processes, wiring methods, wiring materials, and motor controls.

**Prerequisites:** OEET 154 and consent of instructor.

### OEET 252. Electrical Apprenticeship VI

#### 6 Credits

In-depth commercial applications to include commercial/industrial service calculations, mobile home parks, multi-family dwellings, and commercial fire/security systems.

**Prerequisites:** OEET 251 and consent of instructor.

### OEET 253. Electrical Apprenticeship VII

#### 6 Credits

Control devices in commercial/industrial applications; emphasis on logic in-line diagrams, time delay starters, reversing starters, and manual/magnetic solenoids.

**Prerequisites:** OEET 252 and consent of instructor.

**OEET 254. Electrical Apprenticeship VIII****6 Credits**

Miscellaneous topics for the journeyman electrician to include power distribution/transmission, solid state controls and relays, photoelectric and proximity controls and programmable controllers.

**Prerequisites:** OEET 253 and consent of instructor.

**OEET 295. Special Topics****1-6 Credits**

Topics to be announced in the Schedule of Classes.

## OEGR-DIGITAL GRAPHIC TECH (OEGR)

**OEGR 221. Cooperative Experience I****1-3 Credits**

Student employed in approved work site; supervised and rated by employer and instructor. Each credit requires specified number of hours of on-the-job work experience. Restricted to majors. Graded S/U.

**Prerequisite:** consent of instructor.

## OEGR-DIGITAL GRAPHIC TECH (OEGR)

**OEGR 221. Cooperative Experience I****1-3 Credits**

Student employed in approved work site; supervised and rated by employer and instructor. Each credit requires specified number of hours of on-the-job work experience. Restricted to majors. Graded S/U.

**OEGR 221. Cooperative Experience I****1-3 Credits**

Student employed in approved work site; supervised and rated by employer and instructor. Each credit requires specified number of hours of on-the-job work experience. Restricted to majors. Graded S/U.

**Prerequisite(s):** OEGR 181.

**OEGR 231. Introduction to GIS Spatial Analysis****4 Credits (3+3P)**

This course aims to provide students with the knowledge and skills necessary to investigate the spatial patterns which result from social and physical processes operating on or near the Earth's surface. Essential theoretical concepts of quantitative geography are examined, including measures of geographical distribution (including point and areal pattern analysis) and spatial autocorrelation, interpolation and network connectivity. Students will also be introduced to ArcView (online GIS) and the open source programs such as QGIS and GRASS. May be repeated up to 4 credits.

**Prerequisite(s):** OEGR 181.

**OEGR 231. Introduction to GIS Spatial Analysis****4 Credits (3+3P)**

This course aims to provide students with the knowledge and skills necessary to investigate the spatial patterns which result from social and physical processes operating on or near the Earth's surface. Essential theoretical concepts of quantitative geography are examined, including measures of geographical distribution (including point and areal pattern analysis) and spatial autocorrelation, interpolation and network connectivity. Students will also be introduced to ArcView (online GIS) and the open source programs such as QGIS and GRASS. May be repeated up to 12 credits. Restricted to Community Colleges campuses only.

## OEPS-PUBLIC SAFETY (OEPS)

**OEPS 150. Correctional Officer Training I****4 Credits (2+4P)**

Introduction to corrections, departmental policies and procedures, report writing, officer safety, and physical conditioning. Restricted to majors.

**Prerequisite:** consent of instructor.

**OEPS 180. Correctional Officer Training II****4 Credits (2+4P)**

Criminal justice system, communications, ethics, correctional law and responsibilities, search procedures, hostage situations, institutional gangs. Restricted to majors OEPS 195.

**Prerequisite:** consent of instructor.

**OEPS 250. Correctional Officer Training III****4 Credits (2+4P)**

Use of force, firearms, baton, chemical agents, standard first aid, and CPR. Restricted to majors.

**Prerequisite:** consent of instructor.

**OEPS 280. Correctional Officer Training IV****4 Credits (2+4P)**

Stress management, supervision of special needs offender, defensive driving, preparation for certifying exams. Restricted to majors.

**Prerequisite:** consent of instructor.

## OEPT-PHOTOGRAPHIC TRADES (OEPT)

**OEPT 100. Photographics I****3 Credits (2+2P)**

Covers basic black and white photographic techniques. Emphasizes black and white film and paper handling, film processing, proof printing, projection print, and print finishing. Adjustable camera required. Same as ART 270.

**OEPT 120. Photo Finishing and Presentation****2 Credits (1+2P)**

Use of visual language for personal expression. Freelance photography; care of original photos; preparation of portfolios, photographic markets, exhibitions and judging, galleries and copyrights. Students will prepare a photographic portfolio. Restricted to: Community Colleges only.

**Prerequisite(s):** CMT 115.

**OEPT 155. Portraiture****3 Credits (2+2P)**

Hands-on study of professional photography involving people. Studio and environmental portraits, fashion/glamour, and wedding photography. Studio and exterior lighting techniques, selecting lighting equipment, film and supplies. Restricted to: Community Colleges only.

**Prerequisite(s):** ART 270 or CMT 115.

## OETS-TECHNICAL STUDIES (OETS)

### OETS 100. Industrial/Construction Safety

#### 2 Credits

Covers safety issues such as PPE, BBP, ladder safety,, RTK, HazCom, MSDS and information about safety organizations such as OSHA, NIOSH, NFPA, National Safety Council. Community Colleges only. Restricted to Dona Ana and Carlsbad campuses.

### OETS 102. Career Readiness Certification Preparation

#### 1 Credit

This course is designed to prepare students to successfully obtain Career Readiness Certifications in all areas and at the appropriate levels for their program of study. Graded: S/U. May be repeated up to 3 credits. S/U Grading (S/U, Audit).

### OETS 103. Technical Career Skills

#### 4 Credits

This course will be project-based and will encompass writing, presentation, math, reading, and critical thinking skills applied in a technical environment. Restricted to: Community Colleges only.

### OETS 104. Basic Mathematics for Technicians

#### 4 Credits

Fundamental mathematical concepts and computations including measurement, ratio and proportions, and pre-algebra as it relates to technical programs.

**Prerequisite:** appropriate placement test score.

### OETS 110. Photovoltaic Application

#### 4 Credits (3+2P)

This course will provide an introduction to Photovoltaic (PV) installation. The course will provide instruction on site selection, prep, installation, and maintenance for photovoltaic applications. Students that complete the course and have the opportunity to take the entry level exam with the North American Board of Certified Energy Practitioners (NABCEP) en route to becoming Certified Installers. Restricted to: Community Colleges only.

**Prerequisite(s):** OETS 101.

### OETS 117. Writing for Technicians

#### 3 Credits

Instruction in the skills for developing clear, written descriptions of processes and procedures used by technicians in various fields. Emphasis on correct grammar, logical organization, and receiving audience. Focuses on clarity, structure, and concise writing methods. Does not substitute for ENGL 111G. Restricted to: Community Colleges only.

### OETS 118. Mathematics for Technicians

#### 3 Credits (2+2P)

Analysis and problem solving of technical problems using measuring instruments and techniques of arithmetic, algebra, geometry, and trigonometry. Restricted to: Community Colleges only.

**Prerequisite(s):** OETS 104 or CCDM 103N or appropriate placement test score.

### OETS 120. Business Fundamentals

#### 3 Credits

Instruction in the skills for basic business concepts used by technicians in various fields. Emphasis placed on basic business concepts; business ownership including marketing, management, accounting, and customer services; interpersonal communication; and basic computer concepts including word processing, spreadsheets, and presentation software. Restricted to Community Colleges campuses only.

### OETS 255. Special Topics Technical Studies

#### 1-6 Credits

Topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

**Prerequisite(s):** Consent of instructor.

## P E-PHYSICAL EDUCATION (P E)

### P E 102. Beginning Weight Training

#### 1 Credit

Introduction to basic principles and techniques of weight training.

### P E 103. Beginning Weight Training for Women

#### 1 Credit

Introduction to basic principles and techniques of weight training as related to women.

### P E 104. Military Physical Fitness

#### 1 Credit

Directed physical fitness activities designed to develop and maintain muscular strength/endurance, cardiopulmonary efficiency, flexibility, and coordination required for leadership roles after graduation.

### P E 109. Pilates

#### 1 Credit

Designed exercise program involves the entire body while focusing on strengthening the core muscles of the torso. Exercises promote coordination, balance, and strength.

### P E 112. Beginning Volleyball for Men

#### 1 Credit

### P E 113. Beginning Volleyball for Women

#### 1 Credit

### P E 114. Basketball for Women

#### 1 Credit

### P E 115. Basketball for Men

#### 1 Credit

### P E 117. Beginning Soccer

#### 1 Credit

Introduction to the basic techniques and skills of soccer.

### P E 127. Cardio-Kickboxing

#### 1 Credit

Activities that mimic punches, blocks, and kicks which have been modified to serve the purpose of providing a cardiovascular workout.

### P E 128. Aerobic Dance

#### 1 Credit

Designed to increase knowledge of the human body's responses to exercise, enhance the level of muscular development, and cardiovascular endurance with the use of music.

### P E 129. Step Aerobics

#### 1 Credit

Designed to increase knowledge of the human body's responses to exercise, enhance the level of muscular development, and cardiovascular endurance with the use of music and steps.

### P E 130. Beginning Swimming

#### 1 Credit

### P E 131. Aqua Aerobics

#### 1 Credit

Designed to increase knowledge of the human body's responses to exercise, enhance the level of muscular development, and cardiovascular endurance through exercise in water.

**P E 132. Intermediate Swimming****1 Credit**

Development of fitness through participation in aquatics activities.

**Prerequisite(s):** Ability to swim 200 yards.

**P E 134. Lifeguard Training****2 Credits**

Skills training for a nonsurf lifeguard. Course will include Standard First Aid and CPR certification.

**Prerequisites:** swim 500 yards, dive to 9-foot depth and retrieve a 10-pound brick, surface dive to 5 feet then swim under water 15 yards, tread water one minute.

**P E 147. Beginning Tennis****1 Credit****P E 148. Beginning Racquetball****1 Credit****P E 150. Beginning Golf****1 Credit****P E 154. Personal Defense****1 Credit**

Physical conditioning and defense skills for men and women.

**P E 159. Introduction to Brazilian Jiu-Jitsu****1 Credit**

Brazilian Jiu-Jitsu is primarily a ground fighting art. This course will place heavy emphasis on positional strategy and focus on the sportive aspect of the sport. A Judo/Jiu-Jitsu Gi (uniform) is required.

**P E 166. Futsal (Five-A-Side Soccer)****1 Credit**

Futsal, official form of indoor soccer, approved by FIFA.

**P E 173. Running Fitness****1 Credit**

Basic fitness knowledge techniques and training methods of fitness running are practiced and refined.

**P E 199. Yoga****1 Credit**

A holistic approach to exercise benefiting the body, mind, and spirit.

Practices focus on alignment, strength, breath relaxation, and restoration.

**P E 202. Intermediate Weight Training****1 Credit**

Intermediate training and skill techniques in weight lifting.

**Prerequisites:** P E 102 or consent of department head.

**P E 203. Weight Training for Olympic and Powerlifting****1 Credit**

Designed to teach the Olympic form-the clean, jerk and snatch. Class format is a preprogrammed style of instruction with preset programs.

Emphasis placed on developing sound lifting techniques.

**Prerequisite(s):** P E 103 or consent of department head.

**P E 204. Cross Training****1 Credit**

Intensive training program that incorporates both aerobic and resistive overload approaches to training.

**P E 205. Walking Fitness****1 Credit**

Basic fitness knowledge techniques and training methods of fitness walking are practiced and refined.

**P E 206. Beginning Physical Fitness****1 Credit**

Progressive exposure to steady state exercise tailored to individual needs for the purpose of determining, improving, and maintaining physical fitness.

**P E 209. Intermediate Pilates****1 Credit**

Intermediate training and skill techniques in Pilates.

**Prerequisite(s):** PE 109 or consent of instructor.

**P E 212. Intermediate Volleyball-Men****1 Credit**

**Prerequisite:** P E 112 or consent of department head.

**P E 213. Intermediate Volleyball-Women****1 Credit**

**Prerequisite:** P E 113 or consent of department head.

**P E 215. Intermediate Walking****1 Credit**

A continuation of basic fitness knowledge techniques and training methods of fitness walking are practiced and refined.

**Prerequisite:** P E 205 or consent of department head.

**P E 216. Advanced Walking****1 Credit**

Advanced walking fitness and training techniques are presented, practiced, and refined.

**P E 228. Intermediate Aerobic Dance****1 Credit**

Aerobic dance at a high intensity level with a more in-depth study of the body's physiological response to exercise.

**Prerequisite:** P E 128 or consent of department head.

**P E 229. Intermediate Step Aerobics****1 Credit**

Step aerobic dance at a high intensity level with a more in-depth study of the body's physiological response to exercise.

**Prerequisite:** PE 129 or consent of department head.

**P E 230. Advanced Swimming****1 Credit**

Perfection of basic strokes, survival swimming, and physical fitness.

**Prerequisite(s):** P E 130 or ability to swim 100 yards.

**P E 263. Outdoor Recreation Skills****1 Credit**

Selected outdoor activities. Appropriate subtitles, such as hiking and backpacking, camping and survival, hunting and gun safety, casting and angling skills. May be repeated for maximum of 4 credits.

**P E 270. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Each offering will carry appropriate subtitle. May be repeated for a maximum of 4 credits.

**P E 299. Intermediate Yoga****1 Credit**

Intermediate training and skill techniques in Yoga.

**Prerequisite(s):** PE 199 or consent of instructor.

## PE-P-PHYSICAL EDUCATION (PE P)

### PE P 185. Introduction and Foundations

#### 3 Credits

Historical and cultural foundations and vocational, scientific, and educational data on careers in health education, physical education, and recreation. Restricted to: Main campus only.

### PE P 208. Fitness for Health and Sport

#### 3 Credits

A study of the fitness needs for health enhancement and sport participation. Restricted to: P E, SP M, KIN, S ED majors.

### PE P 210. Theory and Technique of Aquatics

#### 2 Credits

Introduction to fundamental aquatics knowledge and skills.

**Prerequisite(s):** Ability to swim 100 yards.

### PE P 315. Elementary School Physical Education

#### 3 Credits (2+2P)

Methods for teaching physical education at the elementary level. Primary focus on creating a learning environment for the acquisition and enhancement of developmentally appropriate locomotor, manipulative, and nonmanipulative skills. Field experience included. Consent of instructor required. Restricted to SED/PE P majors.

**Prerequisite(s):** GPA of 2.5.

### PE P 319. Lifetime Activities

#### 2 Credits

Knowledge and skills related to the lifetime activities of swimming, weight training, and other fitness promoting activities with emphasis on learning progressions.

**Prerequisite(s):** PE P 208.

### PE P 323. Racquet Sports

#### 2 Credits

Knowledge and skills related to the racquet sports of tennis, badminton, and pickleball with emphasis on developmental strategies and skill performance that influences pedagogical content knowledge.

Administrative issues will be addressed.

### PE P 363. Theory and Technique of Lifelong Outdoor Leisure Activities

#### 2 Credits

Knowledge and skills related to lifelong outdoor leisure activities, including the examination of environmental science and awareness, kinesiology, and fundamental motor skills.

### PE P 392. Theory and Technique of Sports and Games

#### 2 Credits

Knowledge and skills related to team sports and games, with emphasis on developmental strategies and skill performance that influence pedagogical content knowledge. Administrative issues will also be addressed.

### PE P 393. Theory and Technique of Dance and Rhythms

#### 2 Credits

Knowledge and skills related to dance and rhythms, with emphasis on the analysis of dance elements and its role in physical education.

### PE P 394. Designing Student Centered Afterschool Physical Activity Clubs

#### 3 Credits

Knowledge, skills and field based practical application for creating student centered and student designed after school physical activity clubs.

### PE P 455. Adapted Physical Education

#### 3 Credits

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student.

**Prerequisite:** junior or senior standing.

### PE P 465. Senior Seminar

#### 3 Credits

Capstone course for physical education. Graded S/U.

**Prerequisite:** senior standing.

### PE P 466. Methods of Teaching Secondary Physical Education

#### 6 Credits

Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of instructor required.

**Prerequisite(s):** PE P 315 and admittance to TEP required.

### PE P 499. Problems

#### 1-3 Credits (1-3)

Problems in physical education and recreation and independent work in their solutions. A maximum of 3 credits during any one semester. May be repeated up to 6 credits. Consent of Instructor required.

### PE P 501. Special Topics

#### 1-3 Credits (1-3)

Offered under various subtitles that indicate the subject matter. May be repeated for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

### PE P 515. Advanced Athletic Training Education

#### 3 Credits

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. Consent of Instructor required.

### PE P 550. Advanced Topics in Physical Education

#### 1-4 Credits

Advanced study in teaching processes, perceptual motor development, bioenergetics, biomechanical instrumentation, psychological bases of performance, or motor control.

### PE P 551. Sociology of Sports

#### 3 Credits

### PE P 555. Adapted Physical Education

#### 3 Credits

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student. Same as PE P 455 with additional requirements for graduate credit.

**Prerequisite:** consent of instructor.

### PE P 557. Adapted Physical Education : A Practitioner's Approach

#### 3 Credits

Preparation for qualified physical education professionals to teach individuals with disabilities motor and fitness skills. Knowledge of the Adapted Physical Education National Standards is developed so students may become nationally certified in the field. The inclusion of disability sports into general physical education curriculum is also major emphasis of this course. Consent of Instructor required.

**PE P 624. The Social Construction of the Body****3 Credits**

This course will explore how people's health and physical activity experiences and choices are often shaped by cultural narratives and expectations of the male and female body. Designed for graduate students in allied health and physical activity professions

**PHIL-PHILOSOPHY (PHIL)****PHIL 100G. Philosophy, Law and Ethics****3 Credits**

An introduction to practical problems in moral, social, political, and legal philosophy. Topics to be discussed may include ecology, animal rights, pornography, hate speech on campus, same-sex marriage, justice, abortion, terrorism, treatment of illegal immigrants, and New Mexican Aboriginal Peoples' land claims.

**PHIL 101G. The Art of Wondering****3 Credits**

Introduction to some of the main problems of philosophy, with an emphasis on critical thinking. Philosophy conceived as an aid to living in this world with oneself and with others.

**PHIL 124G. Philosophy of Music****3 Credits**

This is an introductory course in the philosophy of music. This course will survey three questions: What is music? Why is music important? How can we distinguish good music from bad music? We will draw examples from a wide variety of musical genres, from classical music, jazz and blues to punk and rap. Students will be encouraged to apply philosophical theorizing to think about their preferred musical form.

**PHIL 136G. The Quest for God****3 Credits**

An effort to understand the religious life; a consideration of some of the traditional approaches to God and what it means to be religious.

**PHIL 201G. Introduction to Philosophy****3 Credits**

Selected problems within the main branches of philosophy: metaphysics, theory of knowledge, ethics. Practice given in critical thinking.

**PHIL 211G. Informal Logic****3 Credits**

Logical analysis of ordinary language, construction of definitions, argumentation, analysis of fallacious modes of thought and basic rhetorical considerations.

**PHIL 223G. Ethics****3 Credits**

The philosophical explication of morality. Significant ethical systems developed in the history of Western thought.

**PHIL 305. Philosophy and Literature****3 Credits**

Examination of philosophical ideas as presented in selected literary works and literary criticism.

**PHIL 306. Philosophy Through Film****3 Credits**

An exploration of a range of philosophical issues through the use of film. Topics include personal identity and memory, faith and the problem of evil, free will and moral responsibility, and the meaning of life. Films may include *The Prestige*, *Memento*, *The Third Man*, *A Clockwork Orange*, *Fight Club*, and *Synecdoche, New York*.

**PHIL 312. Formal Logic****3 Credits**

Introduction to symbolic logic and its application in the analysis of arguments in scientific and ordinary discourse.

**PHIL 315. Philosophy of Language****3 Credits**

A critical examination of philosophical inquiries into the syntactic, semantic, and pragmatic dimensions of language.

**PHIL 316. Philosophy of Mathematics****3 Credits**

Survey of traditional philosophical problems and views concerning the nature of mathematics including such questions as: What is the nature of mathematical knowledge? What is mathematical truth? What is a number? What is proof? What is the relationship between logic and mathematics?

**PHIL 320. Social and Political Philosophy****3 Credits**

This course critically examines such fundamental concepts as liberty, equality and human rights.

**PHIL 321. Biomedical Ethics****3 Credits**

Examines ethical dimensions of such issues as abortion, euthanasia, and physician-assisted suicide; informed consent as a condition of treating patients and experimenting on subjects; genetic engineering; and alternative reproductive methods, including surrogate motherhood. Also considers what implications moral theories have for these issues.

**PHIL 322. Environmental Ethics****3 Credits**

Explores the ethical and topical issues raised by mining and grazing, air and water pollution, factory farming, global warming, and treatment of animals. It also studies some recent ecological movements such as ecofeminism, social ecology, and deep ecology.

**PHIL 323V. Engineering Ethics****3 Credits**

The moral legal responsibilities of engineers to clients, employers, the public, and the environment. Topics include criteria for judging when risk is acceptable, the duty to safeguard public health and welfare, conflicts of interest, and whistle-blowing.

**Prerequisite:** Junior standing or higher.

**PHIL 327. Ethics and Sports****3 Credits**

Examines contemporary ethical issues related to sports, including the relationship between morally right action and that required for competitive success, strong paternalism in sports, fair play, doping, sportsmanship, and the impact of sports on society.

**PHIL 328. Applied Ethics****3 Credits**

Examines the implications of utilitarianism, Kantian ethics, natural law theory, and other moral theories for controversial moral issues such as the death penalty, euthanasia, abortion, genetic engineering, gay marriage, affirmative action, and pornography.

**PHIL 330. Ethics and Biomedical Research****3 Credits**

Explores some ethical issues raised by biological and biomedical research. Topics include: possible abuses of genetic engineering, cloning, and genetically modified foods; experimentation on humans and informed consent; animal experimentation; honesty in research and conflicts of interest; and intellectual property.

**PHIL 331. Philosophy of Religion****3 Credits**

The nature, fundamental concepts, and problems of religion. Emphasis on the significance of religion for creative and practical value.

**PHIL 332. Ethics and Global Poverty****3 Credits**

Philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

**PHIL 341. Ancient Philosophy****3 Credits**

Introduction to the philosophies of the pre-Socratics, Socrates, Plato, Aristotle, with brief discussion of the Epicureans and Stoics.

**PHIL 344. Modern Philosophy****3 Credits**

Foundations of contemporary thought: introduction to the philosophies of Descartes, Bacon, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and Hegel.

**PHIL 346. Philosophy of Mind****3 Credits**

Examination of some of the most influential accounts of the mind, focusing on such issues as the relation between the mind and the body, mental causation and consciousness.

**PHIL 350. Epistemology****3 Credits**

Introduction to epistemology. The philosophical critique of alleged ways of knowing. An examination of the nature of truth.

**PHIL 351. Philosophy of Science****3 Credits**

Philosophical examination of the methodology of science. The logical, metaphysical, epistemological, and ethical critique of science and its impact on human affairs.

**PHIL 361. Special Topics****3 Credits**

Specific subjects announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

**PHIL 363. Independent Studies****1-3 Credits**

For students with some background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHIL 373. Ethical Theory****3 Credits**

The critical examination of the justification of ethical theories with particular attention to the language of moral discourse.

**PHIL 376. Philosophy of Law****3 Credits**

Ethical, logical, and epistemological implications of law, together with an analysis of the rhetoric of legal practice.

**PHIL 380. Metaphysics****3 Credits**

Introduction to metaphysics: a treatment of such issues as the meaning of existence, the mind-body problem, the problem of universals, and free will versus determinism.

**PHIL 385. Human Nature and the Good Life****3 Credits**

An examination of some of the most historically and philosophically influential conceptions of human nature and corresponding accounts of the good life.

**PHIL 397. Existentialism****3 Credits**

The origins of existentialist thought in philosophy and literature, including the thought of Nietzsche, Kierkegaard, Dostoyevsky, Camus, and Sartre. The course covers topics in ethics and political philosophy, metaphysics, philosophical psychology, philosophy of religion, and other sub-disciplines of philosophy.

**PHIL 413. Modal Logic****3 Credits**

A formal introduction to the logic of necessity, possibility, and impossibility: the syntactic and semantic aspects of the formal modal systems T, S4, S5, as well as their philosophical implications.

**PHIL 448. Writing Philosophy****3 Credits**

A workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes.

**Prerequisite(s):** completed 18 hours of philosophy credit.

**PHIL 463. Independent Studies****1-3 Credits**

For students with a strong background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHIL 505. Advanced Studies in Philosophy and Literature****3 Credits**

Examination of philosophical issues (e.g. personal identity, free will, moral dilemmas, the meaning of life) as presented in selected literary works and literary criticism. Consent of Instructor required.

**PHIL 532. Advance Studies in Ethics and Global Poverty****3 Credits**

Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

## PHLS-PUBLIC HEALTH SCIENCES (PHLS)

**PHLS 100. Introduction to Health Science****1 Credit**

An overview of professional career opportunities in the realm of health science as well as the functional roles of practice, education, administration, and research. Some field trips will be required.

**PHLS 150G. Personal Health and Wellness****3 Credits**

A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others.

**PHLS 275. Foundations of Health Education****3 Credits**

Role and responsibility of the health educator with emphasis on small group dynamics, oral and written communication skills, building community coalitions and an introduction to grant writing. Taught with PHLS 375. Cannot receive credit for both PHLS 275 and PHLS 375. May be repeated up to 3 credits.

**Prerequisite(s):** PHLS 150G, or consent of instructor.

**PHLS 295. Essentials of Public Health****3 Credits**

The course will focus on principles and major areas of public health, including ecological and total personal concept of health care system, epidemiological approaches to disease prevention and control. Consent of Instructor required.

**PHLS 301V. Human Sexuality****3 Credits**

Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles.

**PHLS 305V. Global Environmental Health Issues****3 Credits**

Introduction to global environmental health challenges in the 21st century with an emphasis on environmental problems as they affect public health and personal well-being.

**PHLS 375. Foundations of Community Health Education****3 Credits**

Role and responsibility of the health educator, with emphasis on small-group dynamics, oral and written communication skills, building community coalitions, and an introduction to grant writing. Equivalent to PHLS 275. May be repeated up to 3 credits.

**PHLS 380V. Women's Health Issues****3 Credits**

A focus on the unique issues and problems that confront women today and how they affect the health of women. Same as W S 381V.

**PHLS 395. Foundations of Public Health****3 Credits**

The course will focus on principles and major areas of public health, including ecological concepts of healthcare systems and epidemiological approaches to disease promotion and control. Equivalent to PHLS 295. May be repeated up to 3 credits. Restricted to: Public Health majors.

**PHLS 450. Epidemiology****3 Credits**

Epidemiologic approaches to disease prevention and control. Factors influencing health status. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 471.

**PHLS 451. Biometrics and Health Research****3 Credits**

Critical analysis of community health research and related methodologies. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** A ST 311G.

**PHLS 452. Environmental Health****3 Credits**

Introduction to environmental health designed to address public health issues. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** Junior or Senior standing.

**PHLS 457. Administration of Health Programs****3 Credits**

Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 395 or PHLS 450, or consent of instructor.

**PHLS 458. Public Health Resources and Policy Analysis****3 Credits**

Covers issues related to U.S.-health policy and allocation of resources. Examination of local, state, and federal public health and health care funding. Assessment of impact of health policy on health education, medical practice, and the workplace. May be repeated up to 3 credits.

**PHLS 459. Infectious and Noninfectious Disease Prevention****3 Credits**

History, etiology, and prevention of diseases affecting humans. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: MPH 559. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 395 and Consent of Instructor.

**PHLS 460. American Indian Health****3 Credits**

Critical health issues facing American Indians in the contemporary world. Course included in the undergraduate American Indian Program minor. May be repeated up to 3 credits. Crosslisted with: MPH 560.

**PHLS 461. Health Disparities: Determinants and Interventions****3 Credits**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. May be repeated up to 3 credits. Crosslisted with: MPH 561.

**PHLS 462. Hispanic Health Issues****3 Credits**

Cultural differences that aid or hinder communication with Hispanic clients and the application of cross-cultural communication skills. Some field trips may be required. May be repeated up to 3 credits. Crosslisted with: MPH 562.

**PHLS 464V. Cross-Cultural Aspects of Health****3 Credits**

An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles.

**PHLS 465. International Health Problems****3 Credits**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. May be repeated up to 3 credits. Crosslisted with: MPH 565.

**Prerequisite(s):** PHLS 395 or consent of instructor.

**PHLS 466. International Health Practicum****1-3 Credits**

Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits. Crosslisted with: MPH 566. Restricted to: Public Health majors.

**PHLS 467. Rural Health Issues****3 Credits**

Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. May be repeated up to 3 credits. Crosslisted with: MPH 567.

**PHLS 468. Coping with Loss and Grief: A Cross-Cultural Perspective****3 Credits**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included.

**PHLS 469. U.S.-Mexico Border Health Issues****3 Credits**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. May be repeated up to 3 credits. Crosslisted with: MPH 569.

**PHLS 471. Health Informatics****3 Credits**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. May be repeated up to 3 credits. Crosslisted with: MPH 571. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 395 or consent of instructor.

**PHLS 473. Health Program Planning****3 Credits**

Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. May be repeated up to 3 credits. Restricted to: Public Health majors.

**PHLS 475. Methods of Community Health Education****3 Credits**

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. May be repeated up to 3 credits. Crosslisted with: MPH 575. Restricted to: Public Health Majors majors.

**Prerequisite(s):** PHLS 275/375.

**PHLS 476. Theoretically-Based Interventions****3 Credits**

Identifying and developing interventions to problematic health-related behaviors. Taught with MPH 576. May be repeated up to 3 credits.

Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 473.

**PHLS 478. Health Program Evaluation and Research****3 Credits**

Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 473.

**PHLS 481. Public Health Preparedness and Response****3 Credits**

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits.

**PHLS 486. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PHLS 490. Independent Study****1-6 Credits**

Individual studies with prior approval of department head. Maximum of 12 credits. May be repeated up to 12 credits. Consent of Instructor required.

**PHLS 496. Community Health Education Field Experience****1-6 Credits**

Senior-standing community health education majors will integrate and apply various concepts related to actual community health education practice. Experience aims to prepare students to integrate the competencies and responsibilities of community health education. Approximately 55 hours at field agency required per credit hour. May be repeated for a maximum of 6 credits. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 475 or concurrent enrollment.

**PHLS 497. Senior Seminar in Community Health Education****1 Credit**

Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. May be repeated up to 1 credits. Restricted to: Public Health majors.

**Prerequisite(s):** PHLS 475 or consent of instructor.

**PHLS 499. Problems in Health Education****3 Credits**

Provides opportunity for synthesis of program planning, implementation, and evaluation methodologies in the preparation and delivery of health education topics. Some field trips will be required. May be repeated up to 3 credits. Restricted to: Public Health majors.

**Prerequisite(s):** Either PHLS 395, PHLS 478, PHLS 476, or consent of instructor.

## PHYS-PHYSICS (PHYS)

**PHYS 110G. The Great Ideas of Physics****4 Credits (3+3P)**

Conceptual, quantitative, and laboratory treatments of the great ideas and discoveries that have influenced lives and changed perceptions of nature, from Johannes Kepler's laws of planetary motion and Isaac Newton's and Albert Einstein's laws of motion and gravity to the modern concepts of the quantal structure of nature and the big bang universe.

**PHYS 120G. Introduction to Acoustics****4 Credits (3+2P)**

Lecture, demonstration, and laboratory treatment of the general properties of waves, the production, transmission, and reception of sound waves, including musical and vocal sounds, and characteristics of the human ear and several kinds of sources.

**PHYS 150. Elementary Computational Physics****3 Credits (2+2P)**

Introduction to computational techniques for the solution of physics-related problems. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 121G or MATH 190G or MATH 191G.

**PHYS 203. Supplemental Instruction to PHYS 213****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 213. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 213.

**PHYS 204. Supplemental Instruction to PHYS 214****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 214. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 214.

**PHYS 205. Supplemental Instruction to PHYS 215G****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 215G. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 215G.

**PHYS 206. Supplemental Instruction to PHYS 216G****0.5-1 Credits (.5-1)**

Optional workshop as a supplement to PHYS 216G. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 216G.

**PHYS 210. Introductory Physics for the Health Sciences****3 Credits**

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

**Prerequisite(s):** MATH 120 or Equivalent.

**PHYS 211G. General Physics I****3 Credits**

Non-calculus treatment of mechanics, waves, sound, and heat. Knowledge of simple algebra and trigonometry is required.

**PHYS 211GL. General Physics I Laboratory****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 211G.

**Prerequisite(s)/Corequisite(s):** PHYS 211G.

**PHYS 212G. General Physics II****3 Credits**

Non-calculus treatment of electricity, magnetism, and light. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 211G or PHYS 221G.

**PHYS 212GL. General Physics II Laboratory****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 212G.

**Prerequisite(s)/Corequisite(s):** PHYS 212G.

**PHYS 213. Mechanics****3 Credits**

Newtonian mechanics. Pre/

**Corequisite(s):** MATH 191G.

**PHYS 213 L. Experimental Mechanics****1 Credit**

Laboratory experiments associated with the material presented in PHYS 213. Science majors. Pre/

**Corequisite(s):** PHYS 213.

**PHYS 214. Electricity and Magnetism****3 Credits**

Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 192G. Prerequisite(s): a C- or better in PHYS 213 or PHYS 215G, and MATH 191G.

**PHYS 214 L. Electricity and Magnetism Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 214.

**Prerequisite(s)/Corequisite(s):** PHYS 214. Prerequisite(s): a C- or better in PHYS 213L or PHYS 215GL.

**PHYS 215G. Engineering Physics I****3 Credits**

Calculus-level treatment of kinematics, work and energy, particle dynamics, conservation principles, simple harmonic motion. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 191G.

**PHYS 215GL. Engineering Physics I Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 215G. Students wishing to use the PHYS 215G-216G sequence to satisfy the basic natural science general education requirement must register for either PHYS 215GL or PHYS 216GL. Pre/

**Corequisite(s):** PHYS 215G.

**PHYS 216G. Engineering Physics II****3 Credits**

A calculus-level treatment of topics in electricity, magnetism, and optics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 213 or PHYS 215G and MATH 192G.

**PHYS 216GL. Engineering Physics II Laboratory****1 Credit**

Laboratory experiments associated with the material presented in PHYS 216G.

**Prerequisite(s)/Corequisite(s):** PHYS 216G. Prerequisite(s): A C- or better in PHYS 213L or PHYS 215GL.

**PHYS 217. Heat, Light, and Sound****3 Credits**

Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 213 or PHYS 215G, and MATH 191G.

**PHYS 217 L. Experimental Heat, Light and Sound****1 Credit**

Laboratory experiments associated with the material presented in PHYS 217. Science majors.

**Prerequisite(s)/Corequisite(s):** PHYS 217. Prerequisite(s): a C- or better in PHYS 213L or PHYS 215GL.

**PHYS 218. Supplemental Instruction to PHYS 217****0.5-1 Credits (.5-1)**

This optional workshop supplements PHYS 217 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 217 to problem solving and quantitative analysis. May be repeated up to 1 credits.

**Corequisite(s):** PHYS 217.

**PHYS 221G. General Physics for Life Sciences I****3 Credits**

This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

**Prerequisites:** a C or better in MATH 120 or higher.

**PHYS 221GL. Laboratory to General Physics for Life Science I****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 221G.

**Prerequisite(s)/Corequisite(s):** PHYS 221G. Restricted to Las Cruces campus only.

**PHYS 222G. General Physics for Life Sciences II****3 Credits**

This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 211G or PHYS 221G, and MATH 121G.

**PHYS 222GL. Laboratory to General Physics for Life Sciences II****1 Credit**

Laboratory experiments in topics associated with material presented in PHYS 222G.

**Prerequisite(s)/Corequisite(s):** PHYS 222G. Restricted to Las Cruces campus only.

**PHYS 223. Supplemental Instruction to PHYS 221****1 Credit**

This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.

**Corequisite(s):** PHYS 221G.

**PHYS 224. Supplemental Instruction to PHYS 222****1 Credit**

This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving.

**Corequisite(s):** PHYS 222G.

**PHYS 280. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 290. Special Topics****1-3 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PHYS 303V. Energy and Society in the New Millennium****3 Credits**

Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

**PHYS 304. Forensic Physics****4 Credits (3+3P)**

Theories, laboratory, and field techniques in the area of forensic physics.

**PHYS 305V. The Search for Water in the Solar System****3 Credits**

Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.

**PHYS 315. Modern Physics****3 Credits**

An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 291G and PHYS 214 or PHYS 216G.

**PHYS 315 L. Experimental Modern Physics****3 Credits (1+6P)**

Elementary laboratory in modern physics which supports the subject matter in PHYS 315. Required for physics majors. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** PHYS 315. Prerequisite(s): a C- or better in PHYS 214L or 216GL.

**PHYS 316. Supplemental Instructions to PHYS 315****1 Credit**

This optional workshop supplements PHYS 315 "Modern Physics". Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.

**Corequisite(s):** PHYS 315.

**PHYS 350. Special Topics****1-3 Credits**

Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

**PHYS 380. Individual Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 395. Intermediate Mathematical Methods of Physics****3 Credits**

Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): a C- or better in MATH 291G.

**PHYS 400. Undergraduate Research****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 420. Capstone Project I****3 Credits**

Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

**PHYS 421. Capstone Project II****3 Credits**

Continuation of PHYS 420.

**PHYS 450. Selected Topics****1-3 Credits**

Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

**PHYS 451. Intermediate Mechanics I****3 Credits**

Vector calculus, Lagrangian and Hamiltonian formulations of Newtonian mechanics. Topics include central force motion, dynamics of rockets and space vehicles, rigid body motion, noninertial reference frames, oscillating systems, relativistic mechanics, classical scattering, and fluid mechanics. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392. Prerequisite(s): a C- or better in PHYS 213 or PHYS 215G, and MATH 291G.

**PHYS 454. Intermediate Modern Physics I****3 Credits**

Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392 and PHYS 395. Prerequisite(s): a C- or better in PHYS 315.

**PHYS 455. Intermediate Modern Physics II****3 Credits**

Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 454, MATH 392, and PHYS 395.

**PHYS 461. Intermediate Electricity and Magnetism I****3 Credits**

The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** MATH 392 and PHYS 395. Prerequisite(s): a C- or better in PHYS 214 or PHYS 216G or equivalent and a C- or better in MATH 291G.

**PHYS 462. Intermediate Electricity and Magnetism II****3 Credits**

Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 461, MATH 392, and PHYS 395.

**PHYS 467. Nanoscience and Nanotechnology****3 Credits**

See CHME 467. Crosslisted with: CHME 467. ).

**Prerequisite(s):** CHEM 112 and (PHYS 211 or PHYS 215) and (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard.

**PHYS 468. Intermediate X-ray Diffraction****3 Credits**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Crosslisted with: CHME 488.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 471. Modern Experimental Optics****3 Credits (1+6P)**

Advanced laboratory experiments in optics related to the material presented in PHYS 473.

**Prerequisite(s):** PHYS 315 and PHYS 315L.

**PHYS 473. Introduction to Optics****4 Credits**

The nature of light, Geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. May be repeated up to 4 credits.

Crosslisted with: E E 473.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**PHYS 475. Advanced Physics Laboratory****1-3 Credits (1+6P)**

Advanced undergraduate laboratory involving experiments in atomic, molecular, nuclear, and condensed-matter physics. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 476. Computational Physics****3 Credits**

An introduction to finite difference methods, Fourier expansions, Fourier integrals, solution of differential equations, Monte Carlo calculations, and application to advanced physics problems. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 150 or equivalent and MATH 392.

**PHYS 478. Fundamentals of Photonics****4 Credits (3+3P)**

See E E 478. Crosslisted with: E E478.

**Prerequisite(s):** PHYS 216G or PHYS 217.

**PHYS 479. Lasers and Applications****4 Credits (3+3P)**

See E E479 Crosslisted with: E E479.

**Prerequisite(s):** C- or better in E E 315 or PHYS 461.

**PHYS 480. Thermodynamics****3 Credits**

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 217, PHYS 315, and MATH 291G.

**PHYS 485. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**PHYS 488. Introduction to Condensed Matter Physics****3 Credits**

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315.

**PHYS 489. Introduction to Modern Materials****3 Credits**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315.

**PHYS 491. High Energy Physics I****3 Credits**

Particle detectors, accelerators, and experimental techniques. Fundamental particles and interactions. Symmetries in particle physics. Quark model of hadrons. Electroweak theory. Strong interactions and QCD. Nuclear interactions at high energies. Grand unification. Super symmetry. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 455.

**PHYS 493. Experimental Nuclear Physics****3 Credits (1+6P)**

Selected experimental investigations in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in PHYS 315 and PHYS 315L.

**PHYS 495. Mathematical Methods of Physics I****3 Credits**

Applications of mathematics to experimental and theoretical physics. Topics selected from: complex variables; special functions; numerical analysis; Fourier series and transforms, Laplace transforms. May be repeated up to 3 credits.

**Prerequisite(s):** a C- or better in MATH 392 and PHYS 395.

**PHYS 500. Special Topics Seminar****1-2 Credits**

Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

**PHYS 511. Mathematical Methods of Physics I****3 Credits**

Same as PHYS 495. Additional work required at a more advanced level.

**PHYS 520. Selected Topics****1-3 Credits**

Formal treatment of graduate-level topics not covered in regular courses. May be repeated for a maximum of 9 credits.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.

**PHYS 521. Individual Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

**Prerequisites:** graduate standing, consent of instructor, and selection of a specific topic prior to registration.

**PHYS 528. Fundamentals of Photonics****4 Credits (3+3P)**

Same as E E 528. Crosslisted with: E E528.

**PHYS 551. Classical Mechanics****3 Credits**

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

**PHYS 554. Quantum Mechanics I****3 Credits**

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

**PHYS 555. Quantum Mechanics II****3 Credits**

Continuation of topics in PHYS 554.

**Prerequisites:** PHYS 554 or consent of instructor.

**PHYS 561. Electromagnetic Theory I****3 Credits**

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

**PHYS 562. Electromagnetic Theory II****3 Credits**

Continuation of topics in PHYS 561.

**Prerequisites:** PHYS 561 or consent of instructor.

**PHYS 567. Nanoscience and Nanotechnology****3 Credits**

See CHME 567. Crosslisted with: CHME 567.

**PHYS 568. Elements of X-ray Diffraction****3 Credits**

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

**PHYS 571. Advanced Experimental Optics****3 Credits**

Taught with PHYS 471 with additional work required at the graduate level.

Consent of Instructor required.

**Prerequisite(s):** PHYS 473 or PHYS 562.

**PHYS 575. Advanced Physics Laboratory****1-3 Credits (1+6P)**

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

**PHYS 576. Advanced Computational Physics I****3 Credits**

Advanced treatment of topics listed under PHYS 476, plus additional required work. Applications of numerical methods to complex physical systems. Recommended knowledge of Fortran or C, and MATH 377 or MATH 392. Same as PHYS 476, but additional work required.

**PHYS 577. Fourier Methods in Electro-Optics****3 Credits**

Same as E E 577 Crosslisted with: E E 577

**PHYS 584. Statistical Mechanics****3 Credits**

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

**PHYS 588. Condensed Matter Physics****3 Credits**

Same as PHYS 488, but additional work required.

**Prerequisite(s):** PHYS 554 or consent of instructor.

**PHYS 589. Modern Materials****3 Credits**

Same as PHYS 489 with differentiated assignments for graduate students.

**Prerequisite:** PHYS 554 or consent of instructor.

**PHYS 591. Advanced High-Energy Physics I****3 Credits**

Taught with PHYS 491 with additional work required at the graduate level.

**Prerequisite(s):** PHYS 555 or consent of instructor.

**PHYS 592. Advanced High-Energy Physics II****3 Credits**

Continuation of topics in PHYS 591

**Prerequisite(s):** PHYS 591.

**PHYS 593. Advanced Experimental Nuclear Physics****3 Credits (1+6P)**

Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

**PHYS 597. Space Plasma Physics****3 Credits**

Same as PHYS 497 but with added requirements.

**PHYS 599. Master's Thesis****1-15 Credits (1-15)**

Thesis.

**PHYS 600. Research****1-15 Credits**

Doctoral research. May be repeated.

**PHYS 620. Advanced Topics in Physics****1-3 Credits**

Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**PHYS 650. General Relativity I****3 Credits**

Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.

**Prerequisite(s):** PHYS 511 or PHYS 561 or consent of instructor.

**PHYS 680. Independent Study****1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member.

May be repeated for a maximum of 6 credits.

**Prerequisite:** graduate standing or consent of instructor.

**PHYS 688. Advanced Condensed Matter Physics****3 Credits**

Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

**PHYS 689. Advanced Modern Materials****3 Credits**

Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces.

**Prerequisites:** PHYS 555, PHYS 588, or consent of instructor.

**PHYS 691. Quantum Field Theory I****3 Credits**

Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.

**Prerequisites:** PHYS 555 and PHYS 562, or consent of instructor.

**PHYS 692. Quantum Field Theory II****3 Credits**

QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.

**Prerequisite:** PHYS 691 or consent of instructor.

**PHYS 700. Doctoral Dissertation****1-15 Credits (1-15)**

Dissertation.

## PL-S-PARALEGAL SERVICES (PL S)

**PL S 160. Legal System for the Paralegal****3 Credits**

Introduction to the court system, administrative agencies, functions of law offices, and professional conduct and legal ethics. Restricted to: Community Colleges only.

**Prerequisite(s):** ACT standard score in English of 16 or higher or a Compass score 76 or higher; for those scoring 13-15 in English on ACT or 35-75 on Compass, successful complete of CCDE 105N or CCDE 110N; for those scoring 12 or below on the ACT standard score in English or 34 or below on the Compass, successful completion of CCDE 105N & CCDE 110N.

**PL S 161. Legal Terminology****3 Credits**

Survey of the language of the law that will serve either as an introductory course or as a review course to prepare students for the certification test.

**PL S 162. The Virtual Law Office****3 Credits**

The Virtual Law Office class is a 'hands-on', project oriented course designated to provide the student with the basic law office skills needed to function successfully in a law office setting. The student will gain a practical, working knowledge of the procedures necessary to work in a law office. The skills learned in the class will directly translate to real life situations. Restricted to: Community Colleges only.

**Prerequisite(s):** PL S 160.

**PL S 180. Constitutional Law for the Paralegal****3 Credits**

Case standing of the law of the Constitution and Bill of Rights with regard to day-to-day applications in the law practice. Documents dealing with constitutional problems in both civil and criminal areas of law will be drafted and discussed.

**Prerequisite:** PL S 160.

**PL S 190. Criminal Law for the Paralegal****3 Credits**

Introduction to federal and state criminal law; criminal proceedings, prosecution and defense, sentencing and appeal.

**Prerequisite:** PL S 160.

**PL S 200. Legal Ethics for the Paralegal****3 Credits**

Introduction to ethical dilemmas faced in the workforce and the rules of ethics developed by the American Bar Association, various national paralegal organizations, and the Supreme Court of New Mexico.

Restricted to: Community Colleges only.

**Prerequisite(s):** PL S 160.

**PL S 203. Immigration Law****3 Credits**

Survey of the basics of immigration law including the rights and obligations of citizenship and the naturalization process.

**Prerequisite:** PL S 160.

**PL S 221. Internship I****2-4 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships can be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. Restricted to Community Colleges campuses only.

**Prerequisite(s):** PL S 274.

**PL S 222. Internship II****1-3 Credits**

Continuation of PL S 221. Each credit requires specified number of hours of on-the-job work experience. Restricted to Community Colleges campuses only.

**Prerequisite(s):** PL S 221.

**PL S 231. The Law of Commerce for the Paralegal****3 Credits**

Law of contracts, negotiable instruments, bank transfers, secured transactions, debtor-creditor relations, agency, and business types and their formation. Students will study the relevant statutes as well as draft documents associated with these types of legal practice. Restricted to: Community Colleges only.

**Prerequisite(s):** PL S 160.

**PL S 272. Bankruptcy Law for the Paralegal****3 Credits**

Individual and corporate bankruptcy; the basic principles and processes of bankruptcy law as a system of debtor relief and debt collection.

**Prerequisite:** PL S 160.

**PL S 274. Legal Research and Writing for the Paralegal I****3 Credits**

Legal memoranda, briefs, and pleadings will be prepared and written based on the student's original research. Research materials and techniques will be identified and studied; introduction of computer usage in legal research.

**Prerequisite:** PL S 160 and ENGL 111G.

**PL S 275. Tort and Insurance for the Paralegal****3 Credits**

Primary legal principles of tort and insurance law and means of establishing insurance plans, types of torts and insurance, as well as use of specific forms and procedures relating to these areas.

**Prerequisite:** PL S 160.

**PL S 276. Wills, Trusts, and Probate for the Paralegal****3 Credits**

Cases and statutes dealing with wills, trusts, and probate. Emphasis on preparation and drafting of documents and the application of the law and documents to the client's problems.

**Prerequisite:** PL S 160.

**PL S 277. Family Law for the Paralegal****3 Credits**

Methods of conducting client interviews and drafting of pleadings and research relative to families. Laws relating to marriage, divorce, custody, support, adoption, name change, guardianship, and paternity.

**Prerequisite:** PL S 160.

**PL S 278. Litigation for the Paralegal****3 Credits**

The law of procedure and evidence will be considered through rules and cases. Case situations will be used to identify and solve problems.

**Prerequisite:** PL S 160.

**PL S 279. Legal Research and Writing for the Paralegal II****3 Credits**

Continuation of PL S 274. Advanced training in legal research problems with a focus on analysis, writing, and preparation of sophisticated legal memoranda and documents.

**Prerequisite:** PL S 274.

**PL S 280. Interviewing and Investigation for the Paralegal****3 Credits**

Techniques of legal interviewing and investigation with emphasis on development of human relations and communication skills.

**Prerequisite:** PL S 160.

**PL S 298. Independent Study****1-3 Credits (1-3)**

Individual studies directed by consenting faculty with prior approval by department head. Restricted to Community Colleges campuses only.

**Prerequisite(s):** PL S 160.

## PORT-PORTUGUESE (PORT)

**PORT 213. Portuguese for Romance Language Students I****3 Credits**

Introduction to the Portuguese language, Brazilian culture and civilization. Taught in Portuguese. Open to students with any previous Romance language study (French, Italian, Portuguese, Romanian, Spanish).

**PORT 214. Portuguese for Romance Language Students II****3 Credits**

Continuation of PORT 213.

**Prerequisite:** C or better in PORT 213 or consent of instructor.

**PORT 453. Independent Luso-Brazilian Studies****1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students in Luso-Brazilian studies. May be repeated up to 12 credits. Consent of Instructor required.

**PORT 513. Graduate Portuguese for Romance Language Students I****3 Credits**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

**PORT 514. Graduate Portuguese for Romance Language Students II****3 Credits**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

**Prerequisite(s):** Language placement exam or C or better in PORT 513, or consent of instructor.

## PSY-PSYCHOLOGY (PSY)

**PSY 201G. Introduction to Psychology****3 Credits**

Methods and principles of behavior. Topics include human evolution and development, biopsychology, perception, learning, thinking, motivation, social interaction, and the diagnosis and treatment of abnormal behavior.

**PSY 266. Applied Psychology****3 Credits**

Explanation of the psychological principles of everyday living. Emphasizes motivation, learning of intelligent behavior, and applications of psychology to social issues. Community Colleges only.

**PSY 274. A Study of Substance Abuse through Service Learning****3 Credits**

Physiological and psychological impact of drug use on human behavior. Emphasizes practical applications of intervention and prevention in the community. Community Colleges only.

**PSY 290. Psychology of Adjustment****3 Credits**

Analyzes the responses people have to conflict, emotional stress, and frustration. It focuses on adapting to these problems and examines both normal and neurotic responses. Community College campus only.

**PSY 301. Introduction to Psycholinguistics****3 Credits**

Psychological aspects of language, including linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as LING 301.

**Prerequisites:** PSY 201G and one of: STAT 251G, STAT 271G, or A ST 311; and PSY 310 or consent of instructor.

**PSY 302. Abnormal Psychology****3 Credits**

Introduces the types, causes, and treatment of mental disorders. Descriptions and explanations of the neuroses, affective disorders and the psychoses. Case histories are also analyzed.

**Prerequisites:** PSY 201G, MATH 120 and ENGL 111G.

**PSY 310. Experimental Methods****4 Credits (2+4P)**

The basic skills of literature search, experimental design, research methodology, and research reporting are emphasized; includes laboratory.

**Prerequisite(s):** PSY 201G, and either STAT 251G, STAT 271G, or A ST 311.

**PSY 311. Advanced Research Seminar****4 Credits (2+4P)**

Psychological research in conjunction with designing, conducting, writing, and presenting an independent research project. May also include various computer applications. Will discuss issues regarding application to graduate programs. Course should be taken no later than the first semester of senior year.

**Prerequisite:** PSY 310.

**PSY 315. Emotion****3 Credits**

An overview of the past century of research on human emotion from William James to Antonio Damasio. Explores a cognitive science perspective on emotion that includes questions about developmental, physiological, and evolutionary aspects of emotion and an exploration of the proximate and ultimate functions of emotion. Topics range from understanding the feeling component of emotion to understanding the role of facial displays of emotion.

**Prerequisite(s):** PSY 201G, and one of: STAT 251, STAT 271, or A ST 311G, and PSY 310 or consent of instructor.

**PSY 317. Social Psychology****3 Credits**

Ways in which people are influenced by the behavior of others are analyzed. Includes aggression, altruism, conformity, attraction, sexual behavior, prejudice, and nonverbal behavior.

**Prerequisites:** PSY 201G, MATH 120, and ENGL 111G.

**PSY 320. Learning****4 Credits (3+2P)**

Covers: habituation, Pavlovian conditioning, Thorndikian learning, stimulus generalization, transfer of training, and the learning and forgetting of related and unrelated material.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310.

**PSY 321. Psychology of Personality****3 Credits**

Introduces personality theories and supporting research. Psychoanalytic, physiological, and behavioral theories as they apply to personality are examined. Focuses on normal personality functioning.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310.

**PSY 324. Sexual Behavior****3 Credits**

Examines viewpoints of the evolution, control and function of human sexual behavior. Includes human sexuality, reproduction, male-female conflicts and the social implications of sex. **Prerequisites:** PSY 201G, MATH 120, and ENGL 111G

**PSY 325. Health Psychology****3 Credits**

Life stress, surgical stress, coronary-prone behavior, biofeedback, pain control, psychosocial approaches to geriatrics and cancer, behavioral treatments for addictions, obesity, and interpersonal issues in health care.

**Prerequisite:** PSY 201G.

**PSY 330. Psychology and the Law****3 Credits**

Discretionary practices in the judicial system including pretrial procedures, jury selection, jury decision making, eyewitness testimony, insanity, expert witnesses, and probation judgments.

**Prerequisite:** PSY 201G.

**PSY 340. Cognitive Psychology****3 Credits**

Review of research and theory in the study of human cognitive processes. Topics include information processing, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning. May be repeated up to 3 credits.

**Prerequisite(s):** PSY 201G, MATH 120, and ENGL 111G.

**PSY 342. Cognitive Neuroscience****3 Credits**

Introduction to the study of the neural mechanisms underlying cognitive processes. Topics include relations between neural processes and attention, perception, memory, thinking and language; measuring changes in electrical activity, blood flow, and metabolism in the brain during cognition; the problem of consciousness; and evolutionary perspectives.

**Prerequisites:** PSY 201G and PSY 310.

**PSY 350. Developmental Psychology: Conception through Childhood****3 Credits**

Covers a wide range of topics concerning human psychological development from conception through childhood with special emphasis on current research and theory. May be repeated up to 3 credits.

**Prerequisite(s):** PSY 201G, MATH 120, and ENGL 111G.

**PSY 351. Developmental Psychology: Adolescence through Old Age****3 Credits**

Covers a wide range of topics concerning human psychological development from adolescence through old age with special emphasis on current research and theory.

**Prerequisite:** PSY 201G.

**PSY 359. Psychology of Gender****3 Credits**

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. May be repeated up to 3 credits. Crosslisted with: W S 359.

**Prerequisite(s):** PSY 201G.

**PSY 370. Special Topics****1-3 Credits**

May be taken under different subtitles announced in the Schedule of Classes for unlimited credit. May be repeated for a maximum of 12 credits.

**Prerequisite:** PSY 201G.

**PSY 375. Psychology and the Brain****3 Credits**

An exploration of how the brain produces thinking, emotion, and behavior. May be repeated up to 3 credits.

**Prerequisite(s):** PSY 201G, MATH 120 and ENGL 111G.

**PSY 376. Evolutionary Psychology****3 Credits**

This course introduces the student to the science of Evolutionary Psychology. In this class we will explore how evolutionary psychologists think about a variety of topics ranging from our capacity for (and appreciation of) art, emotions, and beauty to an exploration of the "design" of our minds in regards to mating, status striving, social behavior and cultural production.

**Prerequisite(s):** PSY 201G, and one of: STAT 251, STAT 271, or A ST 311G, and PSY 310 or consent of instructor.

**PSY 380. Perception****4 Credits (4+4P)**

Primary emphasis on vision. Topics include measurement of sensations, development of visual-motor coordination, reading, speech perception, picture perception, illusions, 3-dimensional space, and causes and consequences of visual abnormalities.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310.

**PSY 383. Memory****3 Credits**

Examines facets of human memory from the information processing viewpoint, including encoding, storage, and retrieval and memory-aiding techniques.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 384. Perceptual and Cognitive Development****3 Credits**

Development across the lifespan in perception, memory, attention, reasoning, language and academic skills.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 400. Research****1-3 Credits**

Individual research projects supervised by a department faculty member. May be repeated for a maximum of 6 credits.

**Prerequisites:** PSY 310 and consent of instructor.

**PSY 401. Directed Readings****1-3 Credits**

May be repeated for a maximum of 6 credits.

**Prerequisites:** PSY 201G and consent of instructor.

**PSY 402. Field Experience****1-3 Credits**

Working with preschool, juvenile delinquent, handicapped, aged, convict, or mentally ill. Approximately five hours scheduled work per week per credit. May be repeated to 6 credits.

**Prerequisites:** 6 psychology credits and consent of instructor.

**PSY 417V. Intercultural Relations****3 Credits**

Exploration of cultural and subcultural differences from a psychological perspective. Emphasis on modern cultural settings. Issues may include: ethnocentrism, stereotyping, intercultural communication, culture shock, cultural differences, nonverbal behavior, conflict management, and developing intercultural interaction skills.

**Prerequisite:** PSY 201G.

**PSY 430. Human-Computer Psychology****3 Credits**

Theories, methodologies, and data from psychology applicable to interface design, with an emphasis on construction and application of conceptual psychological models.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 440. History and Systems of Psychology****3 Credits**

History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Also covers recent history of psychology and development of schools of psychology.

**Prerequisites:** PSY 201G, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 442. Thinking****3 Credits**

Research and theory pertaining to human thinking and problem solving. Effective problem-solving methods and common obstacles to problem solving are analyzed.

**Prerequisites:** PSY 201G and PSY 310.

**PSY 445. Clinical Psychology****3 Credits**

Basic theories in clinical psychology and techniques of psychotherapy.

**Prerequisites:** PSY 201G, PSY 302, and one of: STAT 251G, STAT 271G, or A ST 311, and PSY 310 or consent of instructor.

**PSY 450. Senior Thesis****3 Credits**

A laboratory or field research project conducted under faculty supervision. Requires written research proposal, conduct of research, data analysis, and final written report. May be repeated for a maximum of 6 credits.

**Prerequisites:** PSY 310, 6 additional psychology credits, consent of supervising faculty member, and junior or above standing.

**PSY 470. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**PSY 507. Quantitative Methods in Psychology I****3 Credits**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on distributions, probability and basic inferential statistics in Psychological research.

**Prerequisite(s):** An elementary statistics course or consent of instructor.

**PSY 508. Quantitative Methods in Psychology II****3 Credits**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on Analysis of Variance (ANOVA) in Psychological research.

**Prerequisite(s):** PSY 507 or equivalent.

**PSY 509. Quantitative Methods in Psychology III****3 Credits**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on multiple regression in Psychological research.

**Prerequisite(s):** PSY 507 or equivalent.

**PSY 510. Computer Methodology****3 Credits**

Use of computers in psychological research with emphasis on developing experimental control programs.

**PSY 520. Learning****3 Credits**

Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.

**PSY 522. Sensation and Perception****3 Credits**

Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.

**PSY 523. Methods in Cognitive Psychology****3 Credits**

Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems.

**Prerequisite(s):** PSY 524 or consent of instructor.

**PSY 524. Cognitive Psychology****3 Credits**

Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.

**PSY 525. Behavioral Neuroscience****3 Credits**

The biological basis of behavior with an emphasis on human cognitive functioning.

**PSY 527. Social Psychology****3 Credits**

Current and traditional theories, research findings, and research methodologies of social psychology.

**PSY 529. Methods in Social Psychology****3 Credits**

Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems.

**Prerequisite(s):** Graduate student in psychology or consent of instructor.

**PSY 530. Human-Computer Interaction****3 Credits**

Issues associated with human-computer interface design. Concepts, methods, and data from HCI, cognitive psychology, human factors, artificial intelligence, and psycholinguistics that apply.

**PSY 531. Human Memory****3 Credits**

Current and traditional theories and research findings related to human memory.

**PSY 535. Developmental Psychology****3 Credits**

Examines theoretical and empirical work in lifespan developmental psychology, with an emphasis on perceptual and cognitive development, language development, and social cognitive development.

**PSY 540. History and Systems of Psychology****3 Credits**

History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.

**PSY 543. Cognitive Neuroscience****3 Credits**

Introduction to the study of the neural mechanisms underlying cognitive processes. Topics include relations between neural processes and attention, perception, memory, thinking and language; measuring change in electrical activity, blood flow, and metabolism in the brain during cognition; the problem of consciousness; and evolutionary perspectives.

**PSY 547. Engineering Psychology****3 Credits**

Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.

**PSY 550. Teaching of Psychology****3 Credits**

This class serves both new and experienced teachers. It will help new teachers design and conduct a successful course and help experienced teachers improve their teaching.

**PSY 570. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes.

**PSY 590. Research Seminar in Psychology****1 Credit (1)**

Presentations on research by students, faculty, and guest speakers. May be repeated for credit.

**PSY 598. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

**PSY 599. Master's Thesis****15 Credits**

Thesis.

**PSY 600. Doctoral Research****1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

**PSY 698. Special Research Programs****1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

**PSY 700. Doctoral Dissertation****15 Credits**

Dissertation.

## **RADT-RADIOLOGIC TECHNOLOGY (RADT)**

**RADT 100. Introduction to Radiologic Technology and Patient Care****2 Credits**

Overview of the profession, including ethics, terminology, and basic radiation protection. Addresses basic and specialized procedures and topics related to the care of the patient. Restricted to: Community Colleges only. Restricted to Majors.

**RADT 101. Radiographic Positioning I****4 Credits (2+6P)**

Covers radiographic procedure and positioning concepts, techniques, terminology, and mechanics related to the thorax, abdomen, extremities, spine and pelvis. Includes positioning lab and clinical observation.

**RADT 102. Radiographic Positioning II****4 Credits (2+6P)**

Continuation of RADT 101. Includes skull, gastrointestinal, urinary, reproductive, biliary systems, and more advanced skeletal positions. Includes positioning lab and clinical observation. Restricted to: Community Colleges only. Restricted to Majors.

**Prerequisite:** RADT 101.

**RADT 103. Introduction to Radiographic Imaging****3 Credits (2+2P)**

Provides the student with an in-depth knowledge of radiographic exposure technique and the factors affecting radiographic film quality. Includes lab experiments. Restricted to majors.

**RADT 104. Special Radiologic Modalities****2 Credits**

Discussion of various special procedures used in medical imaging such as, angiography, ultrasound, computerized tomography, magnetic resonance imaging, digital imaging, nuclear medicine, radiation therapy, etc. Includes guest lectures and field trips.

**Prerequisite:** RADT 103.

**RADT 105. Radiographic Physics and Equipment****3 Credits**

Fundamentals of rad physics. Includes electromagnetism, x-ray production and interactions, x-ray circuitry, tubes, grids, screens, AES, fluoroscopic and portable units, beam restricting devices, calibration and quality assurance/control. Overview of mammography, US, CT, MRI, and digital radiography. Restricted to: Community Colleges only. Restricted to Majors.

**Prerequisite:** RADT 103 or consent of instructor.

**RADT 110. Radiographic Pathology****1 Credit**

Overview of pathology demonstrated by radiographic procedures. Restricted to majors.

**Prerequisite:** RADT 154.

**RADT 154. Radiographic Anatomy and Physiology****3 Credits**

Basic A&P for radiographic application. Includes a systems approach to body structures and organs as they relate to anatomical projections, radiographic identification, and various imaging modalities. Restricted to: RADT majors. Restricted to: Community Colleges only.

**Prerequisite(s):** AHS 153 or AHS 140 or BIOL 225 or BIOL 154, or consent of instructor.

**RADT 156. Independent Study****1-6 Credits**

Individual studies/research on topics related to the radiological sciences. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.

**RADT 190. CT Equipment and Methodology****3 Credits**

Skill development in the operation of computed tomographic equipment, focusing on routine protocols, image quality, and quality assurance and radiation protection. May be repeated up to 3 credits. Restricted to: CTOM or RADT majors. Restricted to Community Colleges campuses only.

**RADT 200. Radiation Biology and Protection****2 Credits**

Biological effects of ionizing radiation on cells and tissues. Includes radiation measurements, policies and protection measures for self, patients, and others. Restricted to majors. Restricted to: Community Colleges only.

**Prerequisite(s):** RADT 103.

**RADT 201. Clinical Education I****9 Credits**

Supervised practice in a radiology department under direct supervision of a registered technician. Includes film critiques. Community Colleges Only. Restricted to: RADT,OERT majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** RADT 105.

**RADT 202. Clinical Education II****12 Credits**

Continuation of RADT 201. Student will work under indirect supervision of registered personnel. Restricted to: RADT,OERT majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OERT 201.

**RADT 203. Clinical Education III****11 Credits**

Continuation of RADT 202. May be repeated up to 11 credits. Restricted to: RADT,OERT majors. Restricted to Community Colleges campuses only.

**Prerequisite(s):** RADT 202.

**RADT 205. Radiographic Image Critique****1 Credit**

Review of radiographs produced in clinical settings to evaluate anatomy and technical issues. Restricted to majors.

**Prerequisite:** RADT 201.

**RADT 206. Applied Radiographic Procedures****2 Credits (1+3P)**

Advanced course which integrates the principles and techniques of radiologic technology. Restricted to majors.

**Prerequisite:** RADT 202.

**RADT 207. Cross Sectional Anatomy for Medical Imaging****3 Credits**

Anatomic relationships that are present under various sectional orientations as depicted by computed tomography or magnetic resonance imaging. May be repeated up to 3 credits. Restricted to: CTOM or RADT majors. Restricted to Community Colleges campuses only.

**RADT 208. Clinical I (Computed Tomography)****3 Credits**

A health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. May be repeated up to 3 credits. Restricted to: RADT or CTOM majors. Restricted to Community Colleges campuses only.

**RADT 209. Clinical II (Computed Tomography)****3 Credits**

A health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. (Capstone Course). May be repeated up to 3 credits. Restricted to: CTOM or RADT majors. Restricted to Community Colleges campuses only.

## RDG-READING (RDG)

**RDG 350. Teaching and Learning Reading and Writing****3 Credits (2+2P)**

The foundation of this course is on understanding the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature. Crosslisted with: RDG 360

**Prerequisite(s):** ECED 235.

**Corequisite(s):** ECED 440, ECED 455, ECED 329.

**RDG 360. Elementary School Literacy I****3 Credits (2+2P)**

Reading development, curriculum, and instruction in the elementary grades. Required of all elementary education majors as a May be repeated up to 3 credits. Crosslisted with: RDG 350. Restricted to: TEP-EED majors.

**RDG 361. Elementary School Literacy II****3 Credits (2+2P)**

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). May be repeated up to 3 credits. Restricted to: TEP-EED majors.

**Prerequisite(s):** RDG 360.

**RDG 371. Instruction for Special Reading Needs****3 Credits**

Emphasizes appropriate techniques for teaching reading to learners with special needs. May be repeated up to 3 credits. Restricted to: TEP-SPED majors.

**Prerequisite(s):** RDG 356 or RDG 360 and RDG 361.

**RDG 395. Special Topics****1-3 Credits**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits.

**RDG 414. Content Area Literacy****3 Credits (2+2P)**

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Same as RDG 514. May be repeated up to 3 credits. Restricted to: TEP-SED majors.

**RDG 510. Adult and Family Literacy****3 Credits**

Principles, practices, and instructional materials for adult and family literacy. Same as EDUC 506.

**RDG 511. Literacy Assessment and Evaluation****3 Credits**

Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. Same as EDUC 511.

**RDG 514. Content Area Literacy****3 Credits**

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Same as RDG 314.

**RDG 522. Language and Literacy Acquisition****3 Credits**

Framework and strategies of language and literacy acquisition with attention to bilingual learners and the interrelationship among reading, writing, and oral language. Same as BIL 522, RDG 422.

**RDG 525. Pedagogy and Theory of Literature for Adolescents****3 Credits**

This course provides an in-depth exploration of pedagogy and theory related to literature for adolescents

**Prerequisite(s):** Graduate Standing.

**RDG 530. Sociopsycholinguistics of Reading****3 Credits**

Examines current research on reading process, learning to read, and teaching children to read and evaluates current programs and materials.

**RDG 536. Special Studies in Literacy****1-6 Credits**

Each study will be designated by a qualifying subtitle. Same as RDG 636.

**RDG 551. Literacy Development in Early Childhood****3 Credits**

Advanced theory, research, and practice relating to early childhood reading. Same as RDG 351.

**RDG 555. Introduction to Instructional Leadership for Literacy Educators****3 Credits**

Three credit course will introduce students to the roles and responsibilities of literacy specialists in the k-12 school setting.

**Prerequisite(s):** Graduate standing, RDG 511 & RDG 530.

**RDG 560. Elementary School Literacy I****3 Credits (2+2P)**

Reading development, curriculum, and instruction in the elementary grades. Same as RDG 360 with differentiated assignments for graduate students.

**Corequisites:** ECED 550, EDUC 551, and EDUC 552 (block A course).

**RDG 561. Elementary School Literacy II****3 Credits (2+2P)**

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). Same as RDG 361 with differentiated assignments for graduate students.

**Prerequisite:** RDG 560.

**Corequisites:** EDUC 553, EDUC 554, and EDUC 555 (block B course).

**RDG 585. Practicum in Literacy Education****1-6 Credits**

Supervised laboratory experience with children with reading difficulties. The student implements a program of specific procedures to aid the disabled reader.

**Prerequisite:** RDG 511.

**RDG 598. Selected Topics in Literacy****1-6 Credits**

Offered under different subtitles in the Schedule of Classes. Same as RDG 698 with differentiated subjects for doctoral students.

**RDG 600. Doctoral Research in Literacy****1-15 Credits**

Research on topic of interest.

**RDG 605. Independent Study Topics in Reading****1-6 Credits**

A problem and seminar course for those pursuing an advanced degree. Each course will have an appropriate subtitle.

**RDG 608. Critical Issues in Literacy Education****3 Credits**

Critical issues from historical to current perspectives.

**RDG 621. Literacy/Biliteracy Assessment and Evaluation****3 Credits**

Same as BIL 621.

**RDG 630. Ethnography of Reading and Writing****3 Credits**

Covers the dynamics of data interpretation and critical analysis in the study of literacy.

**RDG 633. Praxis and Reflexivity****3 Credits**

Same as BIL 633, ECED 633, EDLT 633, EDUC 633.

**RDG 636. Special Studies in Literacy****1-6 Credits**

Offered under different subtitles in the Schedule of Classes. Same as RDG 536 with differentiated assignments for doctoral students.

**RDG 639. Multiculturalism, Literature, and Inquiry****3 Credits**

Advanced exploration and examination of critical multicultural language education vis-a-vis children's adolescent, young adult, and adult literature, with an eye toward problematizing assumptions about literacy, articulating issues of social justice and enacting transactive, transformative pedagogy. Same as BIL 639.

**RDG 640. Higher Education Teaching Apprenticeship****1-6 Credits**

Instructor apprenticeship in teaching university-level literacy-related classes. Each course should bear a qualifying subtitle. Maximum of 6 credits per semester and a maximum of 6 credits.

**RDG 685. Advanced Internship K-12 Literacy****3 Credits**

Advanced internship in a professional position/research/application within K-12 schools and classes. Restricted to doctoral-level students of any major. Same as BIL 685.

**RDG 698. Selected Topics in Literacy****1-6 Credits**

Offered under various subtitles that indicate the subject matter. Same as RDG 598.

**RDG 699. Research Project****1-15 Credits**

Offered primarily for those pursuing the research requirement for the Ed.S. degree. Each research project will be designated by a qualifying subtitle.

## RESP - RESPIRATORY THERAPY (RESP)

**RESP 110. Respiratory Therapy I****3 Credits**

Introduction to basic respiratory care techniques. Includes history, professional organizations, medical gas administration, oxygen therapy, cardiopulmonary AP, patient assessments, and medical terminology. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 110 L. Respiratory Therapy I Lab****2 Credits**

Laboratory practice of basic respiratory care procedures. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 115. Respiratory Therapy Pharmacology****3 Credits**

Concepts of physics as they apply to the physiology of the lungs. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 120. Respiratory Therapy II****4 Credits**

Advanced respiratory care techniques. Emphasis on airway management, aerosol treatment, chest physiotherapy, pharmacology, posture pressure breathing, and pulmonary rehabilitation. Requires a C or better to remain in program. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Admission to program and RESP 110.

**Corequisite(s):** RESP 120 L.

**RESP 120 L. Respiratory Therapy II Lab****2 Credits**

Continuation of lab practices and procedures learned in RESP 120, Respiratory Care II, using equipment and simulations. Requires a C or better to remain in program. Corequisite(s):RESP 120. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, RESP 110, RESP 110L and RESP 112.

**RESP 124. Respiratory Therapy II Clinical****3 Credits**

Supervised practice and application in a hospital setting. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, RESP 110, RESP 110L and RESP 112.

**Corequisite(s):** RESP 120 and RESP 120L.

**RESP 155. Respiratory Therapy Special Topics****1-4 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 10 credits. Consent of instructor required. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program.

**RESP 210. Respiratory Therapy III****2 Credits**

Introduction to adult, mechanical, neonatal ventilator theory and concepts of critical care medicine. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, and RESP 115, RESP 120, RESP 120L, and RESP 124.

**Corequisite(s):** RESP 210L.

**RESP 210 L. Respiratory Therapy III Lab****2 Credits**

Advanced practice procedures using mechanical ventilation devices. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, and RESP 115, RESP 120, RESP 120 L, and RESP 124.

**Corequisite(s):** RESP 210.

**RESP 224. Respiratory Therapy IV Clinical****3 Credits**

Continuation of RESP 124. Emphasis on mechanical ventilators. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, and RESP 115, RESP 120, RESP 120 L, and RESP 124.

**RESP 230. Respiratory Therapy V****3 Credits**

Continuation of RESP 215. Emphasis on special modalities. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 230 L. Respiratory Therapy V Lab****2 Credits**

Advanced practice and procedures of respiratory care. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 233. Respiratory Therapy Cardiopulmonary****2 Credits**

Concepts of physics as they apply to the physiology of the lung. Emphasis on laws pertaining to gas flow, humidity, and the mechanics of the breathing process. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 234. Respiratory Therapy V Clinical****3 Credits**

Continuation of RESP 214. Emphasis on special modalities. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

**RESP 240. Respiratory Therapy VI****3 Credits**

Advanced theory of hemodynamics, neonate, pediatric, and new specialties that apply to respiratory care. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, and RESP 230, RESP 230L, RESP 233 and RESP 234.

**Corequisite(s):** RESP 240L.

**RESP 240 L. Respiratory Therapy VI Lab****2 Credits**

Advanced laboratory practice and procedures. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, and RESP 230, RESP 230L, RESP 233 and RESP 234.

**Corequisite(s):** RESP 240.

**RESP 242. Pediatric Advanced Life Support (PALS)****1 Credit**

Etiology, diagnosis, clinical manifestations, and management of cardiopulmonary disorders related to respiratory care. Restricted to majors.

**Corequisite:** RESP 230.

**RESP 243. Respiratory Therapy Neonatal Resuscitation****1 Credit**

Advanced practice of the neonatal resuscitation and certification. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program and RESP 230, RESP 230L, RESP 233, and RESP 234.

**Corequisite(s):** RESP 240 and RESP 244.

**RESP 244. Respiratory Therapy VI Clinical****3 Credits**

Clinical experience on special modalities. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program, and RESP 230, RESP 230L, RESP 233 and RESP 234.

**Corequisite(s):** RESP 240.

**RESP 255. Respiratory Therapy Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 4 credits. Consent of instructor required. Restricted to: Community Colleges only. Restricted to RESP majors.

**Prerequisite(s):** Admission to program.

**RGSC-RANGE SCIENCE (RGSC)****RGSC 150. Rangeland Science Profession****1 Credit**

Introduction to scientific disciplines and career opportunities in rangeland science and management.

**RGSC 250. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**RGSC 294. Rangeland Resource Management****3 Credits**

Overview of arid and semi-arid ecosystems in the US and abroad, rangeland plant physiology, ecology of rangeland plant communities and ecosystems, sustainable management for multiple uses including grazing livestock production, wildlife habitat, recreation and ecosystem services, and economics of rangeland-based enterprises. Restricted to: Main campus only.

**RGSC 302V. Forestry and Society****3 Credits**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.

**RGSC 316. Rangeland Plants****3 Credits (2+3P)**

Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants.

**RGSC 317. Rangeland Communities****3 Credits**

Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

**RGSC 318. Watershed Management****3 Credits (2+2P)**

Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality.

**RGSC 325. Rangeland Restoration Ecology****3 Credits**

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.

**Prerequisite(s):** Sophomore standing or consent of instructor.

**RGSC 350. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

**RGSC 357. Grass Taxonomy and Identification****3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys.

**Prerequisite/Corequisite(s):** Junior Standing or consent of the instructor.

**RGSC 390. Internship****1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

**Prerequisite:** consent of instructor.

**RGSC 402. Seminar****1 Credit**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

**Prerequisite(s):** Senior standing.

**RGSC 402 H. Range Science Seminar****1 Credit**

Taught with RGSC 402 with additional work.

**Prerequisite(s):** Meets Honors eligibility and/or Crimson Scholar status and senior standing.

**RGSC 406. Rangeland Team Competition****1 Credit**

Description and characteristics of range plants. May be repeated for a maximum of 4 credits.

**RGSC 440. Rangeland Resource Ecology****3 Credits**

Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.

**Prerequisite(s):** Senior standing.

**RGSC 440 L. Rangeland Resource Ecology Lab****1 Credit**

Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. Corerequisite(s): RGSC 440.

**RGSC 448. Problems****1-4 Credits (1-4)**

Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

**RGSC 452. Vegetation Measurements for Rangeland Assessment****4 Credits (2+4P)**

Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results.

**Prerequisite(s):** RGSC 294 and A ST 311.

**RGSC 458. Livestock Behavior, Welfare and Handling****3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458

**Prerequisite(s):** RGSC 294 or ANSC 100.

**RGSC 460. Rangeland and Natural Resource Planning and Management**  
**4 Credits (3+3P)**

Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues.

**Prerequisite(s):** Senior or graduate student standing.

**RGSC 509. Approaches to Rangeland Research****3 Credits**

Experimental design and statistical analysis of experimental results.

**Prerequisite(s):** A ST 505 or consent of instructor.

**RGSC 513. Advanced Rangeland Ecology****3 Credits**

Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.

**Prerequisite(s):** RGSC 440 or equivalent.

**RGSC 515. Graduate Seminar****1 Credit**

Current topics. Graded S/U.

**RGSC 516. Arid Land Management****3 Credits**

Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.

**RGSC 518. Watershed Methods and Management****3 Credits**

Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.

**RGSC 520. Arid Land Plant Herbivore Interactions****3 Credits**

Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

**RGSC 525. Advanced Rangeland Restoration Ecology****3 Credits**

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements. Research paper required for graduate credit.

**RGSC 550. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**RGSC 557. Advanced Grass Taxonomy and Identification****3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit.

**RGSC 589. Landscape Hydrology Modeling****3 Credits**

The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools. Consent of Instructor required. Crosslisted with: WSAM 589.

**RGSC 598. Special Research Program****1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**RGSC 599. Master's Thesis****15 Credits**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

**RGSC 600. Doctoral Research****1-15 Credits**

Research. Consent of Instructor required. Thesis/Dissertation Grading.

**RGSC 616. Advanced Arid Land Management****3 Credits**

In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

**RGSC 620. Advanced Arid Land Plant-Herbivore Interactions****3 Credits**

In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

**RGSC 698. Special Research Programs****1-4 Credits (1-4)**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

**RGSC 700. Doctoral Dissertation****15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

**RXPP-PRESCRIP PRIV PRAC PSYCH (RXPP)****RXPP 601. Introduction to Psychopharmacology for Psychologists I****3 Credits**

This course is an introduction to physiology and an overview of gross and microanatomy, with a focus on gross, micro, and chemical anatomy of the nervous system. By the end of the course, psychologists will have an up-to-date understanding of human psychology, anatomy, and neuroanatomy. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 602. Introduction to Psychopharmacology for Psychologists II****3 Credits**

Principles of organic chemistry and human biochemistry necessary for the understanding of psychopharmacology are discussed and related to the major transmitter systems and dynamics of transmission. By the end of the course, students will have an up-to-date understanding of biochemistry on which to base further didactic study in psychopharmacology. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 603. Clinical Psychopharmacology I****3 Credits**

This course begins with an introduction to the scope of pharmacology; pharmacoepidemiology, ethical, and legal issues (informed consent, State and Federal regulation of drugs and prescribing, sources of drug information and computer aids) and continues with the principles of pharmacokinetics and pharmacodynamics as they relate to the use of psychotropic medications. It concludes with an introduction to the treatment of anxiety disorders from a biopsychosocial model of care with special emphasis on psychopharmacology for anxiety disorders. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 604. Clinical Psychopharmacology II****3 Credits**

This course is a thorough investigation of the diagnosis and treatment of affective disorders from a biopsychosocial model of care. Particular emphasis is given to psychopharmacological treatment of depressive disorders and bipolar disorders. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 605. Clinical Psychopharmacology III****3 Credits**

This course is an intensive study of the treatment of psychosis from a biopsychosocial model of care. Special consideration is given to: first, second, and third generation antipsychotic drugs and their pharmacology and clinical uses; neurological and metabolic disorders associated with antipsychotic use; and appropriate use of antipsychotics in children and the elderly. Special attention is then given to child and adolescent psychopharmacology, including drugs used in pregnancy and lactation, teratogenicity, embryotoxicity, developmental disorders, conduct disorders, ADHD, and special considerations in use of approved drugs in children. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 606. Pathophysiology for Psychologists I****3 Credits**

This course is an introduction to human clinical physical assessment, history taking, charting, and laboratory testing and neuroimaging. An important emphasis is in functional neuroanatomy and diagnosis and assessment of neurological disorders; role of different components of human nervous system in health and disease; stroke, seizures, and movement disorders (chorea, athetosis, dystonias, dyskinesias, Parkinsonism, akathisia, iatrogenic neurological disorders). Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 607. Pathophysiology for Psychologists II****3 Credits**

Physical assessment and pathophysiology of the cardiovascular system is studied in depth: structure and function of the heart and major blood vessels; innervation of the heart and vessels; electrocardiogram; components of blood; lymphatics; and physical assessment of cardiac function. The physical assessment and pathophysiology of eyes, ears, nose, and the immune system are studied in depth; anatomy and physiology of special senses; assessment of cranial nerves and sensory function; immune function and psychoimmunology. The physical examination and pathophysiology of the chest and pulmonary system and its relationship to the cardiac system is also studied. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 608. Pathophysiology for Psychologists III****3 Credits**

This course continues with an in-depth study of the chest and pulmonary system: pulmonary function and assessment; respiratory exchange and respiratory involvement in acid: base regulation, disorders of respiratory function. The physical assessment of pathophysiology of the gastrointestinal system is discussed in depth: digestion, absorption and excretion of drugs and nutrients from the GI system; disorders of GI function; hepatic function; innervation of GI tract; endocrine and exocrine functions of GI system; physical assessment of GI function. The functions and pathophysiology of the male and female reproductive system, endocrine system, and renal system are discussed as they relate to psychopharmacology. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 609. Psychopharmacological Treatment in Special Populations I****3 Credits**

The psychopharmacology of several special populations are discussed in detail in this course. Geriatric psychopharmacology includes: geriatric physiology; cardiac, renal, hepatic changes with aging; pharmacokinetics/dynamics in the elderly; cognition enhancers in Alzheimer's and other dementias. Special treatment of personality disorders, eating disorders, the importance of racial, ethnic, and gender differences and culturally sensitive practice is presented with applications. Pain management psychopharmacology is over-viewed, including: pharmacology of opioid and non-opioid analgesics; pain syndromes; acute and chronic pain; headache; pharmacological and non-pharmacological approaches to pain management; pharmacology and actions of abused substances: acute effects, withdrawal, biochemistry of tolerance and dependence, brain central reward pathways. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 610. Psychopharmacological Treatment in Special Populations II****3 Credits**

The pathophysiology and treatment of substance use disorders from a biopsychosocial model is presented. Issues of medical comorbidity are studied: psychopharmacological treatment in the medically compromised patient, including case studies and review of comprehensive treatment models; mental disorders due to a general medical condition and/or adverse drug reactions; and referral practices to specialists. Diagnostic rating scales and psychiatric instruments of use to the prescribing psychologist are presented. The course ends with an integration of psychotherapy and pharmacotherapy, including ethical issues such as the right to refuse treatment, treatment compliance/adherence, risk management, and the role of the medical psychologist in the modern, integrated healthcare system. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors.

**RXPP 611. Supervised Experience in Psychopharmacology I****1-3 Credits (1-3)**

In this applied course, students employ their knowledge of psychopharmacology in treatment setting. Students will participate in the treatment of 50 patients for a minimum of 200 hours under the supervision of a physician. Number of credits taken to be determined in consultation with RXPP Training Director. Maximum of 3 credit hours required by degree program. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors. S/U Grading (S/U, Audit).

**RXPP 612. Supervised Experience in Psychopharmacology II****1-3 Credits (1-3)**

Continuation and completion of supervised experience in RXPP 611. Students will participate in the treatment of 50 additional patients for a minimum of 200 hours under the supervision of a physician. The RXPP 611/612 sequence must be completed no sooner than three months and no later than three years from initiation. Number of credit hours taken to be determined in consultation with RXPP Training Director. Maximum of 3 credit hours required by degree program. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits. Restricted to: CLPY majors. S/U Grading (S/U, Audit).

## S WK-SOCIAL WORK (S WK)

**S WK 221G. Introduction to Social Welfare****3 Credits**

A broad overview of current social problems and the role of social agencies and community members in addressing these problems.

**S WK 251. Women s Issues in Social Work****3 Credits**

Examines gender-specific social problems and their identification and resolution through the use of social agencies and community resources. Community Colleges only.

**S WK 253. Case Management****3 Credits**

Introduction to case management for social- and human-services workers. Overview of typical duties and responsibilities of a case manager, including setting goals, performing assessments, writing progress notes, and linking clients with other resources in the community. Recommended for students considering a career in social work or human services. Community Colleges only.

**Prerequisites:** PSY 201G and S WK 221G.

**S WK 300. Social Work Practice Skills****3 Credits**

Introduction to generalist social work practice. Interpersonal skills, values, and ethics required in the helping relationship. Taught in a small-group format. May be repeated up to 3 credits. Restricted to: S WK majors. Restricted to Las Cruces campus only.

**S WK 301. Orientation to Field****1 Credit**

This course will provide an orientation to requirements for a social work field practicum and to establish the transfer of learning between classroom instruction and future practicum skill application. Restricted to S WK majors.

**Corequisite(s):** S WK 300.

**S WK 309. Sociocultural Concepts****3 Credits**

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are examined.

**S WK 311. Human Behavior and the Social Environment I****3 Credits**

Major theories of human behavior and the life span from conception to adolescence. Restricted to: S WK majors.

**Corequisite(s):** S WK 309.

**S WK 312. Human Behavior and the Social Environment II****3 Credits**

Continuation of S WK 311. Major theories of human behavior and the life span from young adulthood through old age. Restricted to: S WK majors.

**Prerequisite(s):** S WK 311.

**S WK 313. Social Work Practice with Individuals****3 Credits**

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with individual client systems. Restricted to: S WK majors.

**Prerequisite(s):** S WK 300.

**S WK 315. Social Work Practice with Families****3 Credits**

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with multicultural family systems. May be repeated up to 3 credits.

**Prerequisite(s):** S WK 300.

**S WK 316. Social Work Research****3 Credits**

This undergraduate course is designed to prepare students to be effective consumers of research and to evaluate their own practice. Students will learn to read, critically evaluate and use the research of others to select interventions that are based on evidence of effectiveness. Students will demonstrate the knowledge, values and skills to be critical consumers of research for effective and ethical practice as well as possess the basic skills necessary to evaluate their own social work professional practice. May be repeated up to 3 credits. Restricted to: Restricted to Social Work majors.

**Prerequisite(s):** STAT 251G, STAT 271G or A ST 251G.

**S WK 331V. Introduction to Social Policy: History****3 Credits**

Historical overview of the economic, political, and cultural impact on social welfare policy, institutions, and professions with international content.

**S WK 401. Field Experience I****3 Credits**

This course is a social work practicum at a university approved agency. This course focuses on generalist social work practice. At this level students are expected to assume substantive responsibility for carrying out social work activities at the beginning level of social work practice. • Students are given the opportunity to observe and assume social work activities in direct and indirect practice under close supervision. • These field work opportunities enable students to apply and integrate previous and current semester learning. • Opportunities will be available for students to develop knowledge of professional practice at multiple system levels and with a variety of cultural, ethnic, racial, gender and age groups. • Students in this Field Practicum Course are required to take a Field Seminar that will provide the students the opportunity to discuss the integration of academic and practice experience learning. Restricted to: S WK majors. S/U Grading (S/U, Audit).

**Corequisite(s):** S WK 412.

**S WK 403. Social Work Practicum II****3 Credits**

This course is a social work practicum at a university approved agency. This course focuses on generalist social work practice. At this level students are expected to assume substantive responsibility for carrying out social work activities at the beginning level of social work practice. • Students are given the opportunity to observe and assume social work activities in direct and indirect practice under close supervision. • These field work opportunities enable students to apply and integrate previous and current semester learning. • Opportunities will be available for students to develop knowledge of professional practice at multiple system levels and with a variety of cultural, ethnic, racial, gender and age groups. • Students in this Field Practicum Course are required to take a Field Seminar that will provide the students the opportunity to discuss the integration of academic and practice experience learning. Restricted to: S WK majors.

**Corequisite(s):** SWK 419.

**S WK 405. Service Learning****3 Credits**

This course introduces students to field work as an essential component of social work education. Students are required to provide a minimum of 40 hours of service to a human services agency. This course will focus on the connection between coursework, field work, the NASW Code of Ethics and skills needed to work with people.

**Prerequisite(s):** S WK 301, S WK 313.

**S WK 412. Practicum Seminar I****3 Credits**

This practicum seminar course must be taken with SWK 401 to provide students who are enrolled in the field practicum course the opportunity to discuss and reflect on social work knowledge, values and skills as they interact with clients in their practicum placement. • Students will have an opportunity to present a case and discuss how they are able to integrate the nine social work competencies • The seminar will provide opportunities to integrate previous and current semester learning.

Restricted to: S WK majors. S/U Grading (S/U, Audit).

**Corequisite(s):** S WK 401.

**S WK 415. Generalist Social Work Practice with Organizations and Communities****3 Credits**

This course focuses on generalist social work values, knowledge and skills regarding practice with larger systems. Course content will include theories of community and organizational assessment and intervention. Strategies for advocacy and change, leadership for community and organizational change. May be repeated up to 3 credits.

**Prerequisite(s):** S WK 300, S WK 313, S WK 315.

**Corequisite(s):** S WK 417.

**S WK 416. Generalist Social Work Practice with Groups****3 Credits**

Generalist social work practice skills with group client systems focusing on the planned change process and the empowerment of oppressed populations. May be repeated up to 3 credits. Restricted to: S WK majors.

**Prerequisite(s):** SWK 415.

**S WK 417. Social Welfare Policy: Legislation****3 Credits**

Policy practice related to the formation of current social welfare policies that promote social and economic justice. Emphasis is on the development and influences of social policy, policy analysis, and the policy change process. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: S WK majors.

**S WK 418. Professionalism in the Field of Social Work****3 Credits**

This course is designed to prepare you to develop professional skills, knowledge, awareness and boundaries as a social worker as you get ready to enter the field practicum. May be repeated up to 3 credits.

Restricted to: S WK majors.

**Corequisite(s):** S WK 419.

**S WK 419. Practicum Seminar II****3 Credits**

This practicum seminar course must be taken with S WK 403 to provide students who are enrolled in the field practicum course the opportunity to discuss and reflect on social work knowledge, values and skills as they interact with clients in their practicum placement. • Students will have an opportunity to present a case and discuss how they are able to integrate the nine social work competencies • The seminar will provide opportunities to integrate previous and current semester learning. May be repeated up to 3 credits. Restricted to: S WK majors. S/U Grading (S/U, Audit).

**Corequisite(s):** S WK 403.

**S WK 443. Family and Child Welfare Practice****3 Credits**

Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning. Cannot receive credit for S WK 443 and M SW 543.

**S WK 447. Identifying Mental Health Concerns****3 Credits**

This course is designed to advance students' knowledge and professional skills for addressing mental health concerns in social work practice at the bachelor's level. Students will learn to identify major mental health concerns across the life span. Culturally competent practices are considered in regard to various mental health concerns. Restricted to: SWK majors.

**S WK 449. Independent Study****1-6 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head.

**Prerequisite:** majors or consent of instructor.

**S WK 490. Family and Child Welfare Policy****3 Credits**

This course is designed to provide students with an understanding of the history and evolution of child welfare policies, initiatives and factors that influence advocacy and practices within the child welfare system. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. Taught with MSW 590. Students enrolled in S WK 490 will not receive credit MSW 590. Students enrolled in S WK 490 will not receive credit MSW 590.

**S WK 497. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Restricted to: S WK majors.

**Prerequisite(s):** Junior or above standing, majors or consent of instructor.

## SMET-SCIENCE/MATH/ENG/TECH (SMET)

**SMET 102. Introduction to Engineering Design.****1 Credit**

Fundamental concepts of engineering design developed through analysis of case studies and hands-on design projects. Consent of instructor required.

**SMET 201. Research for Visiting Community College Students****1 Credit**

Research experience for visiting community college students. Consent of instructor required. Restricted to: Main campus only.

**SMET 301. Undergraduate Research Assistantship****0.5 Credits**

Undergraduate research experience in science, technology, engineering, and mathematics. Consent of instructor required. Graded: S/U.

## SOC-SOCIOLOGY (SOC)

**SOC 101G. Introductory Sociology****3 Credits**

Introduction to social theory, research, methods of analysis, contemporary issues in historical and cross-cultural contexts. Covers groups, deviance, inequality, family, gender, social change, and collective behavior.

**SOC 201G. Contemporary Social Problems****3 Credits**

Introduction to the fundamentals of social analysis through the analysis of contemporary American social problems. Emphasis on methods of analysis and cross-national comparisons showing that the social problems studied are common to all societies. Covers racism, violence, poverty, crime, health care, and substance abuse.

**SOC 258. Current Issues in Marriage and Family****3 Credits**

Examination of contemporary American family life, including courtship, marriage, divorce, and child rearing. Community Colleges only.

**SOC 262. Issues in Death and Dying****3 Credits**

Major personal and social issues related to the process of dying in our culture. Community Colleges only.

**SOC 263. Human Sexuality****3 Credits**

Introduction to cultural and personal aspects of human intimacy, sexuality and the life cycle, sexual variation, and sexually transmitted diseases. Community Colleges only.

**SOC 269. Sexualities and Society****3 Credits**

Examines various sexualities from a sociological perspective. Topics include sexual identity, intimate relationships, sexual desire, sexual behavior, the sex industry, and the politics of sexuality. Discussion of selected topics is grounded in both macro and micro sociological viewpoints. Restricted to: Main campus only.

**SOC 273. Sex and Gender****3 Credits**

Analysis of changes, behaviors, and stereotypes of women and men in contemporary Western societies. Same as W S 273.

**SOC 330V. Introduction to Religious Studies****3 Credits**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. Same as ANTH 330V and HIST 330V.

**SOC 336V. Sociology of Pop Culture****3 Credits**

This course will provide students with a sociological look at creation, distribution, and effects of popular culture that have shaped, preserved, and conveyed distorted images of social class, race, gender and history to unwary consumers.

**SOC 350. Sociological Foundations****3 Credits**

Focus is on becoming a sociologist including career opportunities, thinking critically about society, and conducting sociological inquiry. Emphasis is on identifying and using resources available to sociologists, communication skills for sociologists and acquisition of basic analytic techniques. Restricted to BA Sociology majors.

**Prerequisite(s):** SOC 101G or consent of instructor.

**SOC 351. Sociological Theory****3 Credits**

Analysis of the main historical themes underlying contemporary sociological theory. May be repeated up to 3 credits.

**Prerequisite(s):** SOC 101G.

**SOC 352. Social Research: Methods****3 Credits**

An introduction to research design and data collection strategies commonly employed in the social sciences. Topics include experiments, survey research and various other quantitative and qualitative methods. May be repeated up to 3 credits.

**Prerequisite(s):** SOC 101G.

**SOC 353. Sociological Research: Analysis****3 Credits**

Elementary data analysis class emphasizing descriptive and inferential statistical techniques commonly employed in the social sciences. Topics range from one variable analysis through regression and correlation analysis of two variables. May be repeated up to 3 credits.

**Prerequisite(s):** SOC 101G.

**SOC 357. Gender and Society****3 Credits**

Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives. Same as W S 357.

**SOC 359. Sociology of the Family****3 Credits**

Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity.

**SOC 360V. Introduction to Population Studies****3 Credits**

Determinants and consequences of changes in fertility, mortality and migration patterns. Introduction to techniques of demographic analysis. Focus on U.S. and world population issues and their relation to social, cultural, and economic systems.

**SOC 361V. Social Issues in the Rural Americas****3 Credits**

Same as ANTH 361V.

**SOC 362. Urban Society in a Global World: Problems, Prospects, and Promises****3 Credits**

Identification and analysis of the causes and consequences of social issues in urban environments including poverty, crime, terrorism, urban social policy, suburban flight, disinvestment, and deindustrialization. Special emphasis on global forces affecting global urban environments around the world.

**SOC 365. Environmental Sociology****3 Credits**

Societal responses to environmental problems including social adjustments to natural and technological hazards, socio-cultural aspects of technological risk and impact assessment, and emergence of environmental social movements.

**SOC 371. Race and Ethnic Relations****3 Credits**

Dynamics of racial prejudice and patterns of racial and ethnic interaction in the United States.

**SOC 374V. Comparative Family Systems****3 Credits**

A comparative analysis of family forms and characteristics in various societies. An examination of the diversity of family practices among ethnic and class groups in the United States. Same as W S 374G.

**SOC 375. Social Inequality****3 Credits**

Analysis of the social distinctions arising from sex, age, occupation, and ethnicity. Emphasis on indicators of social class and patterns of social mobility.

**SOC 376V. Social Change****3 Credits**

Explanations of autonomous and directed social change as occurring at the individual, organizational, societal, and international levels. Case studies from around the world.

**SOC 381. Individual and Society****3 Credits**

Ways people influence each other and the mutual interaction of the individual and society. Topics include attitudes, attitude change, conformity, liking and friendship patterns.

**SOC 390. Sociology of Childhood****3 Credits**

This course examines theories, methods, and empirical research in several areas of the sociology of childhood. Major themes are: (1) how social structure constrains children's lives, (2) how children negotiate, share, and create culture, and (3) how children's experiences vary within and across societies.

**SOC 391. Crime and Society****3 Credits**

Analysis of crime at the interpersonal, organizational, and social structure levels in society. Exploration of contemporary images of crime in mass media. Examination of connections between race, class, gender, and crime in U.S. society.

**SOC 392. Juvenile Delinquency****3 Credits**

Nature, extent, and causes of juvenile delinquency; juvenile justice; modern methods of treatment; programs of prevention.

**SOC 393. Youth and Society****3 Credits**

Comparative historical analysis of social, economic and cultural forces affecting young people. Emphasis on organizational and institutional effects on the well being of children and young adults.

**SOC 394V. Sports and Society: A Global Perspective****3 Credits**

A critical examination of sports in a global context, emphasizing the social and cultural factors that shape the world of sports and the consequences of sports for societies. Course examines issues of social inequality, violence, media and corporate influence, religion and sports, and the student-athlete experience.

**SOC 401. Introduction to Sociological Practice****3 Credits**

The application of sociological theory and research method. May be taught as service learning course. May be repeated up to 3 credits.

Restricted to: SOC majors.

**Prerequisite(s):** SOC 101G, senior standing or consent of instructor.

**SOC 409. Community Development****3 Credits**

This is a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Topics include examining what 'community' means, community development versus economic development, and alternative economic activities.

**Prerequisite(s):** SOC 101G.

**SOC 430. Social Movement Theory****3 Credits**

Overview of key theories in past and present social movement research. Includes a focus on rational or spontaneous choice theories, resource mobilization, and new social movement theories. Theoretical perspectives focus on analyses of case studies including women's movement, civil rights, and environmental movements.

**SOC 448. Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**SOC 449. Directed Readings****1-3 Credits**

Individual readings or research for either majors or nonmajors. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**SOC 457. Gender, Science, and Technology****3 Credits**

How gender, science and technology are interrelated social constructions. Science and technology are examined as social institutions. Explanations for different rates of participation based on race, class and gender are explored. Same as: W S 467.

**SOC 458V. Comparative Global Family Systems****3 Credits**

The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today.

**SOC 459. Advanced Issues in Sex and Gender****3 Credits**

Comprehensive examination of current gender identity and gender stratification issues. Same as W S 459.

**SOC 460. Sociology of Religion****3 Credits**

Examination of religion in its social context to understand the intricate relations of religion, culture and U.S. society. Recommended preparatory courses: SOC 101G, SOC 273, SOC 376, ANTH 125G.

**SOC 464. Human Society and the Environment****3 Credits**

This course explores the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships.

**Prerequisite(s):** SOC 101G.

**SOC 465V. Environmental Sociology****3 Credits**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements.

**SOC 470. Sociology of Latinos/as in the United States****3 Credits**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women's issues. Recommended preparatory courses: SOC 101G, SOC 270, SOC 371, or HIST 367.

**SOC 473. International Migration****3 Credits**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective.

**Prerequisite(s):** SOC 101G.

**SOC 474. Sociology of Organizations****3 Credits**

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment.

**SOC 477. Sociology of Education****3 Credits**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems.

**SOC 479. Sociology Perspectives on the U.S.-Mexico Border****3 Credits**

Theoretical perspectives and current research on the U.S.-Mexico border region, including topics such as migration, identity, health, gender, and environment.

**SOC 480. Diversity in Alternative Families****3 Credits**

Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life.

**SOC 481. Social Deviance****3 Credits**

Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control.

**SOC 482. Advanced Individual and Society****3 Credits**

Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and inter-group conflict.

**SOC 486. Power and Politics in America****3 Credits**

This course provides an introduction to the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems and facilitates the understanding of the processes and consequences of power distributions in the United States.

**Prerequisite(s):** SOC 101G.

**SOC 489. Globalization****3 Credits**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as GOVT 469.

**SOC 491. Criminological Theory****3 Credits**

Schools of thought, contrasting approaches, and contemporary efforts in theory construction relevant to adult and juvenile offenders.

**SOC 496. Internship****1-6 Credits**

Supervised participation in an appropriate community setting. Taught with SOC 596. May be repeated up to 9 credits. Consent of Instructor required. S/U Grading (S/U, Audit).

**SOC 501. Perspectives on Sociology****3 Credits**

Overview of the field, subfields, and faculty available for students at NMSU. Emphasis on theories and research currently being developed in the Sociology program. Graded: S/U. May be repeated up to 3 credits. Restricted to: Soc majors. S/U Grading (S/U, Audit).

**SOC 509. Advanced Seminar in Community Development****3 Credits**

This is in an advanced seminar addressing a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable.

**Prerequisite(s):** Graduate student standing.

**SOC 530. Advanced Social Movement Theory****3 Credits**

Overview of key theories in past and present social movement research. Topics include a focus on rational or spontaneous choice theories, resource mobilization, and new social movement theories. Theoretical perspectives focus on analysis of case studies including women s movement, civil rights, and environmental movements.

**SOC 548. Graduate Special Topics****3 Credits**

Specific subjects to be announced in the Schedule of Classes.

**SOC 549. Special Research Problems****1-3 Credits**

Individual analytic or experimental investigations. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**SOC 551. Issues in Advanced Quantitative Analysis****3 Credits**

Advanced methods of sociological analysis are examined in detail. Restricted to: SOC majors.

**SOC 552. Seminar in Classical Social Theory****3 Credits**

Analysis of classical social thought within the discipline. Restricted to: SOC majors.

**SOC 553. Seminar in Sociological Research****3 Credits**

Exploration of research methods, issues, and practical application. May be repeated up to 3 credits. Restricted to: Soc majors.

**SOC 558. Seminar: Sociology of the Family****3 Credits**

The family in various societies; evolution of the American family.

**SOC 559. Graduate Seminar in Sex and Gender****3 Credits**

Comprehensive examination of current gender identity and gender stratification issues. Same as W S 559.

**SOC 560. Advanced Sociology of Religion****3 Credits**

Examination of religion in its social context to understand the intricate relations of religion, culture and U.S. society.

**SOC 561. Seminar in Qualitative Research Methods****3 Credits**

This course provides an in-depth examination of qualitative research methods, including the logic, time, and purpose of using such methods.

**Prerequisite(s):** Graduate standing.

**SOC 564. Seminar in Human Society and the Environment****3 Credits**

This is an advanced seminar exploring the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships.

**Prerequisite(s):** Graduate Student Status.

**SOC 565. Advanced Environmental Sociology****3 Credits**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements.

**SOC 569. Advanced Issues in Sexualities****3 Credits**

Various issues in sexualities are addressed through a wide range of theoretical and empirical sociological literatures that involve quantitative and qualitative data. Advanced examination of the ways in which sexuality is constituted in local, cultural and institutional environments.

**SOC 570. Advanced Sociology of Latinos/as in the United States****3 Credits**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women s issues.

**SOC 571. Advanced Race and Ethnic Relations****3 Credits**

In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S.

**SOC 572. Advanced Sociology of Medical Ethics****3 Credits**

Major issues in the roles and relationships of health care providers and consumers, problems in communication, malpractice, patients rights, and ethics. Taught with SOC 472 with additional work required at the graduate level.

**SOC 574. Sociology of Organizations****3 Credits**

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment.

**SOC 575. Graduate Social Stratification****3 Credits**

Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender.

**SOC 577. Advanced Sociology of Education****3 Credits**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems.

**SOC 578. Advanced Sociology of Development and the World System****3 Credits**

Sociological approach to development and the global system. Theories of development, and underdevelopment; world poverty/inequality; Latin America; Africa and Asia in comparative perspectives; transnational borders/U.S.-Mexico border; current topics. Same as GOVT 577.

**SOC 579. Advanced Sociological Perspectives on the U.S.-Mexico Border**  
**3 Credits**

Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment.

**SOC 580. Diversity in Alternative Families**  
**3 Credits**

Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life.

**SOC 582. Individual and Society**  
**3 Credits**

Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict.

**SOC 583. Symbolic Interaction**  
**3 Credits**

Examination of the interaction of self and the social order including society as process, the negotiation of social order, identity as a social product, role taking and the situated self, the social construction of reality with an emphasis on phenomenology and ethnomethodology.

**SOC 586. Advanced Seminar in Power and Politics in the United States**  
**3 Credits**

This is an advanced seminar addressing the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems. It facilitates an understanding of the processes and consequences of power distributions in the United States.

**Prerequisite(s):** Graduate student standing.

**SOC 587. Advanced International Migration**  
**3 Credits**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective.

**Prerequisite(s):** Graduate student standing.

**SOC 589. Advanced Issues in Globalization**  
**3 Credits**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as GOVT 569.

**SOC 596. Internship**  
**1-6 Credits**

Supervised participation in appropriate occupational setting. May be repeated for a maximum of 12 credits. Taught with SOC 496 with additional work required at the graduate level.

**SOC 599. Master's Thesis**  
**6 Credits**

Thesis. Consent of instructor required. Restricted to: Main campus only. Restricted to SOC majors.

**SOIL-SOIL (SOIL)****SOIL 200. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

**SOIL 252. Soils**  
**3 Credits**

Origin, classification, morphology, and physical, chemical, and biological properties of soils.

**Prerequisite:** CHEM 111G and CHEM 112G.

**SOIL 252 L. Soils Laboratory****1 Credit**

Morphological, chemical, physical and biological properties of soil in the laboratory and field.

**Corequisite:** SOIL 252.

**SOIL 300. Special Topics****1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**SOIL 312. Soil Management and Fertility****3 Credits**

Management, conservation, and fertility of soils; physical conditions affecting growth, nutrition, and plant production.

**Prerequisite:** SOIL 252.

**Corequisite:** SOIL 312L.

**SOIL 312 L. Soil Management and Fertility Lab****1 Credit**

Hands-on experience. Includes field trips, videos, calculations, visiting lecturers and other lab activities as possible.

**Prerequisite:** SOIL 252.

**Corequisite:** SOIL 312.

**SOIL 370. Environmental Soil Science****3 Credits**

Continuation of SOIL 252 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as E S 370.

**Prerequisite:** SOIL 252.

**SOIL 391. Internship****1-6 Credits (1-6)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. S/U Grading (S/U, Audit).

**SOIL 424. Soil Chemistry****3 Credits**

Basic elements of soil chemistry including clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

**Prerequisite(s):** SOIL 252L or CHEM 111G and 112G.

**SOIL 447. Seminar****1 Credit**

Organization, preparation, and presentation of current topics in agronomy, horticulture, and soil science. Same as AGRO/HORT 447.

**SOIL 449. Special Problems****1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

**SOIL 450. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree. May be repeated up to 9 credits. Consent of Instructor required.

**SOIL 456. Irrigation and Drainage****3 Credits**

Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.

**SOIL 472. Soil Morphology and Classification****4 Credits (2+2P)**

Terminology used to describe soils. Soil classification systems of the world with emphasis on systems used in the United States. Theory of classification and taxonomy as applied to soils. May be repeated up to 4 credits. Crosslisted with: GEOG 472.

**Prerequisite(s):** SOIL 252.

**SOIL 476. Soil Microbiology****3 Credits**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 252 and BIOL 311 recommended. Same as BIOL 476.

**SOIL 476 L. Soil Microbiology Laboratory****1 Credit**

Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as BIOL 476L.

**Prerequisites:** SOIL 476 or concurrent enrollment.

**SOIL 477. Environmental Soil Physics****3 Credits**

A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.

**SOIL 477 L. Environmental Soil Physics Laboratory****1 Credit**

Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity.

**Prerequisite:** SOIL 252.

**SOIL 479. Environmental Soil Chemistry****3 Credits**

Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

**Prerequisite(s):** SOIL 252L or CHEM 111G and 112G.

**SOIL 485. Materials from Biorenewable Resources****3 Credits**

Types, sources, composition and properties of biomass. Production, processing, and applications of biomass materials with energy, water, cost, sustainability, and waste management considerations. Crosslisted with: AGRO 485, HORT 486, E S 485 and CHME 485.

**Prerequisite(s):** CHEM 211 or CHEM 313 or permission of instructor.

**SOIL 500. Special Topics****1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

**SOIL 505. Research Orientation****4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505 and HORT 505

**SOIL 514. Soil-Plant Relationships****3 Credits**

Physical, chemical, and biological soil environment as it affects plant and crop growth. Same as AGRO/HORT 514.

**Prerequisites:** BIOL 314, SOIL 252.

**SOIL 525. Scientific Writing- How to be a Productive and Effective Writer****1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, HORT 525, HORT 625, SOIL 625 and EPWS 525.

**SOIL 590. Graduate Seminar****1 Credit**

Current research discussions presented by master level graduate students. Not more than one credit toward the degree. Same as AGRO/HORT 590. Crosslisted with: AGRO 590 and HORT 590.

**SOIL 596. Masters Proposal****1 Credit**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, E S 596, GENE 596 and HORT 596. Restricted to: Masters HORT; Masters PLEN majors.

**Corequisite(s):** Master level graduate students.

**SOIL 597. University Teaching Experience****1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and HORT 597

**SOIL 598. Special Research Programs****1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

**SOIL 600. Doctoral Research****1-15 Credits**

Research.

**SOIL 625. Scientific Writing- How to be a Productive and Effective Writer**  
**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students in the 625 course will be required to perform additional research than those students in the 525 cross-listing. Crosslisted with: AGRO 525, HORT 525 and EPWS 525.

**SOIL 630. Advanced Soil Classification**  
**3 Credits**

Philosophy and organization of various soil classification systems, some international in scope, with emphasis on the new USDA system and classroom and field experience in using this system.

**Prerequisite:** SOIL 472 or consent of instructor.

**SOIL 650. Advanced Topics**  
**1-3 Credits**

Colloquium on contemporary topics associated with agriculture, environmental science and engineering. Multidisciplinary topics will be chosen to encourage participation of students from diverse disciplines. May be repeated for a maximum of 9 credits.

**Prerequisite:** consent of instructor.

**SOIL 652. Advanced Soil Physics**  
**3 Credits**

Advanced treatment of soil physics, modeling, includes working on an existing/new research project, modeling existing or new data, step by step guide on the use of some 1-D and 2-D models. Specific areas of specialization will be field scale variability of soil properties, water flow, solute transport, and plant water relations.

**Prerequisite(s):** SOIL 477 and computer literacy; or consent of instructor.

**SOIL 655. Moisture Heat Contaminant Transport Modeling**  
**3 Credits**

Provides clear coverage of the basic principles of heat, moisture and contaminant transport through porous media, and a step-by-step guidance and hands on application on the use of some spreadsheet based and physically based one-and two-dimensional transport models. A similar course does not exist in the college for students that can encourage them to pursue modeling as a means of solving vadose zone and groundwater contamination and remediation problems. Consent of instructor required.

**SOIL 694. Doctoral Seminar**  
**1 Credit**

Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. Same as AGRO 694.

**Prerequisite:** doctoral level graduate students.

**SOIL 696. Doctoral Proposal**  
**1 Credit**

Current research proposal written by doctoral level graduate students. Not more than 1 credit toward the degree. Same as AGRO 696.

**Prerequisite:** doctoral level graduate students.

**SOIL 697. University Teaching Experience**  
**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with:

AGRO 697 and HORT 697

**SOIL 698. Topics in Agronomy**  
**1-6 Credits**

Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

## SP M-SPORTS MEDICINE (SP M)

**SP M 190. Introduction to Athletic Training**  
**3 Credits**

Introduction to the principles of athletic training.

**SP M 191. Medical Terminology**  
**3 Credits**

Study of the structure of medical language with emphasis on sports medicine-related terminology. To include analysis and interpretation of medical documentation. Restricted to: Las Cruces campus only.

**SP M 200. Career Preparation**  
**1 Credit**

From concept to implementation: Career exploration, setting up degree plans, finding graduate programs, developing professional resumes, writing letters of application, seeking letters of recommendation, and interview preparation. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

**SP M 223. Exploring Extreme Human Performance**  
**3 Credits**

A reading, writing and documentary based course studying human's quest and the related sacrifices associated with participating in extreme performance activities such as the Olympics, wakeboarding, snowboarding, military special forces, ultra-run events, marathons, etc. Consent of Instructor required. Restricted to Las Cruces campus only.

**SP M 250. Emergency Response in Sports Medicine**  
**2 Credits**

Designed to provide knowledge and experience in emergency care procedures, blood borne pathogens, and first aid. Students will receive certification in CPR/AED for the Professional Rescuer and in First Aid, upon successful completion of course. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

**Prerequisite(s):** Consent of Instructor.

**SP M 271. Anatomy & Physiology I**  
**3 Credits**

Detailed study of the structure and function of the human musculoskeletal, cardiovascular, respiratory, and peripheral nervous systems. Designed specifically for students interested in allied health professions. Restricted to Las Cruces campus only.

**SP M 271 L. Anatomy and Physiology Laboratory**  
**1 Credit**

Compliment to SP M 271. Students will engage in activities designed to enhance appreciation of the anatomical structures related to the content areas for SP M 271. Restricted to Las Cruces campus only.

**SP M 272. Clinical Practicum I**  
**2 Credits**

Introduction to the clinical aspects of the athletic training education program. Must maintain at least 3.0 GPA. May be repeated up to 4 credits. Consent of Instructor required. Restricted to: SP M majors. Restricted to Las Cruces campus only.

**SP M 273. Clinical Practicum II****3 Credits**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors. Restricted to Las Cruces campus only.

**SP M 275 L. A & P Lab PE/Dance****1 Credit**

Practical laboratory involving the kinematic and kinesthetic aspects of Human Anatomy and Physiology as it applied to Physical Education and Dance Restricted to: Physical Education and Dance. Not acceptable for Kinesiology Majors majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** SP M 271.

**SP M 290. General Medical Conditions****3 Credits**

Study of the recognition, evaluation, management, and treatment of non-orthopedic medical conditions that affect the physically active population. Consent of Instructor required. Restricted to: SP M and Kines Majors majors. Restricted to Las Cruces campus only.

**Prerequisite(s):** SP M 190, 191 and 271/271L.

**SP M 303. Health and Exercise Psychology****3 Credits**

The course examines the reciprocal relationship among physical activity, exercise behavior, and psychological determinants associated with adopting and maintaining an exercise program. Topics include theories of behavioral change, exercise psychology interventions, the benefits/pitfalls of exercise, and psychological factors influencing patient rehabilitation.

**Prerequisite(s):** GPA of 2.75.

**SP M 304. Psychology of Sport****3 Credits**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles.

**Prerequisite(s):** GPA of 2.75.

**SP M 305. Applied Biomechanics****3 Credits**

The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement.

**Prerequisite(s):** SP M 271 GPA of 2.75.

**SP M 305 L. Applied Biomechanics Laboratory****1 Credit**

This course serves to provide an introduction to human movement and its analysis. The conceptual framework of the course will allow for the application of anatomical, mechanical, and electrical concepts in order to better understand the fundamental nature of movement.

**Prerequisite(s):** SP M 271; GPA 2.75.

**SP M 307. Pathophysiology and Human Function(s)****3 Credits**

Students will discuss basic concepts of pathophysiology such as inflammation & repair, infectious diseases, neoplasms, and diseases of specific physiological systems. In addition, students will discuss a variety of case studies, and in so doing will be able to relate pathophysiologic conditions to symptoms, activity restrictions and disability.

**Prerequisite(s):** SP M 271; SP M 271L; SP M 308, GPA 2.75.

**SP M 308. Exercise Physiology****3 Credits (2+2P)**

Basic physiological principles as they apply to exercise and fitness programs. Laboratory experiences included. GPA of 2.75.

**Prerequisite(s):** SP M 271 or PE P 208.

**SP M 309. Neurophysiology and Human Function****3 Credits**

Students will discuss neurological control of human movement. Topics will include central and peripheral nervous system functions, with particular emphasis given to somatosensory afferent and motor efferent control. In addition, students will develop an understanding of the techniques employed to assess neurologic function in various patient populations.

**Prerequisite(s):** SP M 271; SP M 271L; SP M 308; and GPA of 2.75.

**SP M 310. Orthopedic Examination, Evaluation and Diagnosis of Lower Extremity Injuries****4 Credits**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatomy following athletic injury to the lower extremity. Must maintain at least 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 319. Lifetime Activities****2 Credits**

Knowledge and skills with weight training, cardiovascular exercise, Tai Chi, Pilates, and other lifetime activities related to the promotion of health/fitness through a lifespan.

**SP M 320 L. Palpation and Anatomical Kinesiology Laboratory****2 Credits**

Practical hands-on clinical laboratory introducing techniques necessary for physiological and functional kinematic evaluation of human function. May be repeated up to 2 credits.

**Prerequisite(s):** SP M 271, SP M 271L, GPA 2.75.

**SP M 324. Introduction to Exercise Science: Exercise Physiology and Biomechanics****3 Credits**

This course serves to provide a broad introduction to both the physiology of exercise and the mechanics of human movement. The conceptual framework of the course will allow for the development of a broad knowledge base regarding these concepts and the latter portions of the course will focus on real world application of the concepts. Consent of Instructor required.

**Prerequisite(s):** SP M 271 Anatomy and Physiology I.

**SP M 330. Exercise Testing and Prescription****4 Credits**

This combined lecture and lab class introduces students to the scientific basis for and principles of exercise testing and prescription. The focus is on basic approaches to exercise testing and prescription for healthy adults, while application to some special populations with chronic disease will be discussed. GPA of 2.75.

**Prerequisite(s):** SP M 271 and SP M 308 or consent of instructor.

**SP M 341. Motor Development****3 Credits**

Covers development of motor skills from infancy through maturity. Focus on the principles of motor development, early motor behavior, stage theory, and assessment. Field experiences will augment lecture and readings. May be repeated up to 3 credits. Consent of Instructor required.

**SP M 342. Motor Learning****3 Credits**

An examination of the theoretical foundations and related literature that underline the learning, performing, and retention of motor skills with implications for effective teaching and coaching. May be repeated up to 3 credits.

**Prerequisite(s):** GPA of 2.5.

**SP M 371. Anatomy and Physiology II****3 Credits**

Detailed study of the structure and function of the human endocrine, immune, digestive, reproductive, integumentary, central nervous and renal systems. Designed specifically for students interested in allied health professions. GPA of 2.75.

**Prerequisite(s):** SP M 271G or consent of instructor.

**SP M 371 L. Anatomy and Physiology II Lab****1 Credit**

The students will develop skills in palpating various bony landmarks as well as origins and insertions of major soft tissues. In addition, problem based learning scenarios will be used to complement the SP M 371 lecture material and thereby further students understanding of certain physiologic systems including neural, digestive, reproductive, endocrine, and integumentary.

**Prerequisite(s):** SP M 271; SPM 271 L; GPA 2.75.

**SP M 372. Clinical Practicum III****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 373. Clinical Practicum IV****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors.

**SP M 375. Therapeutic Modalities****4 Credits**

The physiological effects, indications, contraindication, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. May be repeated up to 4 credits. Consent of Instructor required. Must maintain 2.75 GPA. Restricted to: SP M, KIN majors.

**Prerequisite(s):** Consent of Instructor, SP M 271.

**SP M 409. Clinical Biomechanics****3 Credits**

The application of biomechanical analysis of human movement as it relates to clinical proficiencies through the use of anatomical, mechanical and electrical concepts.

**Prerequisite(s):** SPM 271, GPA 3.0.

**Corequisite(s):** SP M 409 L.

**SP M 409 L. Clinical Biomechanics Laboratory****1 Credit**

Laboratory experiments and biomechanical analysis of human movement as they relate to clinical proficiencies through the use of anatomical, mechanical and electrical concepts.

**Prerequisite(s):** SP M 271, SP M 409, GPA 3.0.

**Corequisite(s):** SP M 409.

**SP M 410. Orthopedic Examination, Evaluation and Diagnosis of Upper Extremity Injuries****4 Credits**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatom following athletic injury to the upper extremity. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 411. Pharmacology in Athletic Training****2 Credits**

An introduction to general medical conditions and pharmacological applications in the athletic training setting. Emphasis on the laws governing the development and distribution, indications, contraindications, precautions, and interactions of prescription and over-the-counter medications. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 412. Inferential Statistics in Sport and Exercise Science****3 Credits**

Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course Restricted to: KIN, SP M majors.

**Prerequisite(s):** GPA of 2.75; or consent of instructor.

**SP M 413. Statistical Application in Sports and Exercise Science****3 Credits**

An introduction to descriptive statistics and the interpretation of data in the solution of problems in sport and exercise related research. GPA 2.75.

**Prerequisite(s):** Junior or senior standing.

**SP M 415. Therapeutic Exercise****3 Credits**

The physiological effects, indications, contraindications, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: SP M and KINES majors.

**SP M 420. Orthopedic Examination, Evaluation and Diagnosis of Core, Spine and Head Injuries****3 Credits**

Advanced clinical assessment techniques and applications. Must maintain at least a 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors.

**SP M 422. Clinical Practicum V****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: ATER, SP M majors.

**SP M 423. Clinical Practicum VI****3 Credits**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students might complete a general medical rotation with this course Consent of Instructor required. Restricted to: SP M majors.

**SP M 424. Clinical Practicum VII****3 Credits**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students might complete a general medical rotation with this course. Must maintain 2.8 GPA. Consent of Instructor required. Restricted to: ATEP/SP M majors.

**SP M 425. Organization and Administration in Athletic Training****3 Credits**

An introduction to management, leadership, financial strategies, professional development and legal issues related to the athletic training setting. Must maintain 3.0 GPA. Consent of Instructor required. Restricted to: SP M majors.

**SP M 445. Internship****6,12 Credits (6,12P)**

A full-time internship in an approved wellness, fitness, athletic or recreation program with experience in all phases of management and operation. Field instructor supervision. This internship may require relocation to a site outside of the Las Cruces area. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: Kinesiology Majors majors. S/U Grading (S/U, Audit).

**Prerequisite(s):** Senior standing, GPA of 2.75, completion of all major courses.

**SP M 451. Advanced Exercise Physiology****3 Credits**

Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences. GPA of 2.75.

**Prerequisite(s):** SP M 271 and SP M 308 or consent of instructor.

**SP M 456. Exercise for Special Populations****3 Credits**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions.

**Prerequisite(s):** SP M 308 and SP M 330; GPA of 2.75.

**SP M 458. Physical Dimensions of Aging****3 Credits**

This course introduces students to physical, physiological, social, mental, and emotional aspects of human aging. Age-related changes in human function are discussed the context of applied healthcare settings, and the implications for appropriate physical activity and functional independence. GPA of 2.75.

**Prerequisite(s):** SP M 308.

**SP M 460. Principles of Strength and Conditioning****3 Credits**

Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. GPA of 2.75.

**Prerequisite(s):** SP M 308.

**SP M 460 L. Principles of Strength and Conditioning Laboratory****1 Credit**

An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors. GPA of 2.75.

**Prerequisite(s):** SP M 308.

**SP M 465. Ethics and Legal Issues in Athletic Training****3 Credits**

Examination of the legal and ethical issues associated with the practice of athletic training and other health care fields. Must maintain a 3.0 GPA. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: SP M majors.

**SP M 498. Advanced Athletic Training I****1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainer's Association Education Council. Consent of Instructor required.

**SP M 499. Problems****1-3 Credits**

Problems in athletic training and independent work in their solutions. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Junior or Senior status; Consent of ATEP director.

**SP M 504. Psychology of Sport****3 Credits**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles. Same as SP M 304 with additional requirements for graduate credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**SP M 508. Applied Biomechanics****3 Credits**

The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement. Same as SP M 305 with additional requirements for graduate credits Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**SP M 509. Clinical Biomechanics****3 Credits**

The application biomechanical analysis of human movement as it relates to clinical proficiencies through the use of anatomical, mechanical and electrical concepts. Same as SP M 409 with additional requirements for graduate credits Consent of Instructor required.

**Prerequisite(s):** Consent of instructor.

**SP M 510. Graduate Athletic Training Seminar I****1-3 Credits (1-3)**

Advanced seminar topics in athletic training. Students will explore generalized topics within the field of athletic training under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program. Students may engage in teaching and research opportunities in unique areas. Students may explore athletic training topics within the classroom or independently through designated resources Consent of Instructor required.

**SP M 511. Graduate Athletic Training I****1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Students will examine topics in athletic training in conjunction with faculty members within the Commission on the Accreditation of Athletic Training Education (CAATE) Athletic Training Program at New Mexico State University . Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. Consent of Instructor required.

**SP M 512. Inferential Statistics in Sports and Exercise Science**  
**3 Credits**

Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course. Same as SP M 412 with additional requirements for graduate credit Consent of Instructor required.

**Prerequisite(s):** Consent of Instructor.

**SP M 513. Graduate Athletic Training Seminar II**  
**1-3 Credits (1-3)**

Advanced seminar topics in athletic training. Students will explore more specialized topics within the field of athletic training under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program. Students should be prepared to further explore topics previously covered in SP M 512 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas. Students may explore athletic training topics within the classroom or independently through designated resources. Consent of Instructor required.

**SP M 514. Graduate Athletic Training Research I**  
**1-3 Credits (1-3)**

Advanced research topics in athletic training. Students will explore research and evidence based practices within the field of athletic training. Students will work under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program faculty member. Students should be prepared to further explore research topics within a specific discipline with the intent of disseminating and sharing information with the athletic training community. topics previously covered in SP M 512 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas Consent of Instructor required.

**SP M 515. Graduate Athletic Training II**  
**3 Credits**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. Consent of Instructor required.

**SP M 545. Skill Acquisition and Performance**  
**3 Credits**

Behavioral and physiological examination factors that influence the acquisition and performance of motor skills. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: SP M 342.

**SP M 551. Advanced Exercise Physiology**  
**3 Credits**

Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Consent of Instructor required.

**SP M 556. Exercise for Special Populations**  
**3 Credits**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Taught with PE P 456 with additional work required at the graduate level. Consent of Instructor required.

**SP M 558. Physical Dimensions of Aging**  
**3 Credits**

This course introduces graduate students to physical, physiological, social, mental, and emotional aspects of human aging. Age-related changes in human function are discussed in the context of applied healthcare settings, and the implications for appropriate physical activity and functional independence. Graduate students in this course are expected to participate in organizing and leading some of the class discussions and assisting in the identification of appropriate materials for the course. Consent of Instructor required.

**SP M 560. Principles of Strength and Conditioning**  
**3 Credits**

Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Consent of Instructor required.

**SP M 597. Project**  
**1-12 Credits (1-12)**

Selected projects for doctoral students. May be repeated up to 12 credits. Consent of Instructor required.

**SP M 600. Kinesiology Research**  
**1-3 Credits (1-3)**

Research to be conducted under the direction of a Kinesiology faculty member May be repeated up to 15 credits. Consent of Instructor required.

**SP M 608. Cardiovascular Physiology**  
**3 Credits**

This graduate level course provides an in-depth study of cardiovascular structure and function. The course assumes that students have a strong background in human physiology. Topics include, but are not limited to: cellular structure of the heart and vascular system; cardiac function, including electrophysiology of the heart; vascular function; neurohumoral control of the heart and circulation, organ blood flow, exchange function of the microcirculation; the impact of common cardiovascular diseases on cardiovascular structure and function, and cardiovascular adaptations to chronic exercise.

**SP M 660. Designing Resistance Training Program**  
**3 Credits**

Detailed study of the physiological concepts associated with designing resistance-training programs for children, women, seniors, athletic performance and rehabilitation.

**SP M 665. Skeletal Muscle: Structure and Function**  
**3 Credits**

Basic muscle morphology and physiology with molecular and cellular adaptations in skeletal muscle as consequences to varying exercise regimens

**SP M 700. Doctoral Dissertation**  
**1-18 Credits (1-18)**

Doctoral Dissertation hours to be conducted under the direction of a Kinesiology Faculty. May be repeated up to 18 credits. Consent of Instructor required. Thesis/Dissertation Grading.

## SPAN-SPANISH (SPAN)

### SPAN 111. Elementary Spanish I

#### 4 Credits (4)

Spanish for beginners. Speaking and writing common interactions in predictable settings using basic vocabulary and verb tenses. Communicate in Spanish both orally and in writing sufficiently well so as to be able to make yourself understood by native speakers accustomed to dealing with non-native speakers. In spontaneous conversation and in writing, students will be able to produce a few sentences. Prerequisite(s): Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and/or assessment by departmental examination.

### SPAN 112. Elementary Spanish II

#### 4 Credits (4)

Spanish for beginners. Speaking and writing common interactions in predictable settings using basic vocabulary and verb tenses, including talking about events in the past and possible recommendations for the future. Communicate in Spanish both orally and in writing sufficiently well so as to be able to make yourself understood by native speakers accustomed to dealing with non-native speakers. In spontaneous conversation and in writing, students will be able to produce a variety of sentences and form context appropriate to open-ended questions. Prerequisite(s): Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and/or assessment by departmental examination or a C- or better in SPAN 111.

### SPAN 113. Spanish for Heritage Learners I

#### 3 Credits

Emphasis on development of heritage Spanish language skills learned at home and/or in the community. Covers listening comprehension, development of vocabulary and cultural activities to help strengthen heritage language and culture. Students who have previously earned a C or better in SPAN 111 or SPAN 112 may not receive credit for this course.

### SPAN 115. Elementary Spanish I for Hotel, Restaurant and Tourism Managers

#### 4 Credits

Beginning Spanish for HRTM majors only. Will count towards HRTM degree language requirement. Does not count towards language requirement for other majors. Restricted to: Main campus only. Restricted to HRTM majors.

### SPAN 211. Intermediate Spanish I

#### 3 Credits (3)

Speaking, reading and writing. Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and assessment by departmental examination or C or better in SPAN 112.

### SPAN 212. Intermediate Spanish II

#### 3 Credits (3)

Speaking, reading and writing. Not open to Spanish-speaking students except by consent of instructor.

**Prerequisite:** language placement and assessment by departmental examination or C or better in SPAN 211.

### SPAN 213. Spanish for Heritage Learners II

#### 3 Credits

Emphasis on development of heritage language skills learned at home and/or in the community. Covers spoken Spanish, reading activities and grammar skills to build on existing knowledge of the language.

### SPAN 214. Spanish for Heritage Learners III

#### 3 Credits

Continued development of heritage Spanish language skills learned at home and/or in the community. Emphasis on reading, writing and critical thinking skills. Review of grammar points will also be stressed in preparation for upper level courses.

### SPAN 305. Topics in Hispanic Civilization

#### 3 Credits (3)

Group study of selected topics focusing on Hispanic culture and civilization. Topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

**Prerequisite:** SPAN 212 or SPAN 214 or consent of instructor.

### SPAN 306. Special Topics

#### 3 Credits

Group study of Spanish for specialized purposes (e.g. court interpreting, professional language for bilingual teachers, technical writing for the business community). Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**Prerequisite:** SPAN 212 or SPAN 214 or consent of instructor.

### SPAN 312. Grammar for Heritage/Native Speakers of Spanish

#### 3 Credits

For students who have been exposed to Spanish at home or in the community. Review of grammatical concepts and analysis of both spoken and written Spanish. Students cannot receive credit for both SPAN 312 and SPAN 313.

**Prerequisite(s):** SPAN 214 or consent of instructor.

### SPAN 313. Spanish Grammar

#### 3 Credits

A review of the rules of Spanish grammar. Students cannot receive credit for both SPAN 312 and SPAN 313.

**Prerequisite:** SPAN 212 or SPAN 214 or consent of instructor.

### SPAN 314. Spanish Composition

#### 3 Credits

Development of written Spanish skills. Students cannot receive credit for both SPAN 314 and SPAN 315.

**Prerequisite(s):** SPAN 312 or SPAN 313.

### SPAN 315. Composition for Heritage/Native Speakers of Spanish

#### 3 Credits

Discussions of history, and current political and cultural topics pertaining to the Hispanic world. Emphasis on development of writing skills in formal Spanish. Students cannot receive credit for both SPAN 314 and SPAN 315. Fulfills departmental requirement for SPAN 314.

**Prerequisite(s):** SPAN 312 or SPAN 313.

### SPAN 325. Advanced Conversation

#### 3 Credits (3)

Intensive oral practice. Not open to heritage/native speakers of Spanish.

**Prerequisite(s):** SPAN 212 or consent of instructor.

### SPAN 327. Spanish in the Community

#### 3 Credits

Emphasis on use of Spanish outside the classroom in the local communities. Activities include but are not limited to oral histories, language mentoring in schools, assisting with cultural activities and language research.

**Prerequisite(s):** Basic communicative fluency in Spanish as determined by departmental advisor.

**SPAN 340. Introduction to Spanish Linguistics****3 Credits**

General aspects of Spanish linguistics: traditional, descriptive, historical and dialectal.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 350. Introduction to Chicano Studies****3 Credits**

Covers Mexican-American life including language, history, education, politics and literature.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 352. Spanish in Social Contexts****3 Credits**

The study of Spanish in the contexts of the societies in which it is spoken.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 353. Spanglish****3 Credits**

Covers lexical borrowing, code choice, language loss and maintenance, and bilingual cognition.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 360. Introduction to Latin American Studies****3 Credits**

Offers an introduction to topics in Latin American Studies including language, culture, literature, history, sociology and anthropology. Course is taught in English. Spanish majors and minors may receive credit towards degree requirements by submitting course work in Spanish (SPAN 312 or SPAN 313 recommended for SPAN majors or minors).

**SPAN 361. US-Mexico Border Culture- Literature and /or Culture****3 Credits**

Study of major authors and/or cultural trends in the U.S.-Mexico border. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 363. US-Hispanic Culture****3 Credits**

Study of major artistic and cultural trends among US-Hispanics. Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 6 credits under a different subtitle.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 364V. Culture and Civilization of Mexico****3 Credits**

Familiarization with culture, civilization and regions of Mexico. History, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Mexican culture and civilization on the Southwest United States. Taught in English. Does not satisfy Arts and Sciences second language requirement.

**SPAN 365V. Culture and Civilization of Spanish America****3 Credits**

Familiarization with culture, civilization and regions of Spanish America. Study of history, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Spanish American culture and civilization on the Southwest United States. Taught in English. Does not satisfy College of Arts and Sciences second language requirement.

**SPAN 380. Introduction to Hispanic Literature****3 Credits**

Works in Spanish, all genres and periods. How to read literature in all forms.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 385. Introduction to Chicano/US-Mexican Literature****3 Credits**

Introduction to the study of major works by Chicano/US-Mexican authors.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 388. Contemporary Hispanic Literature****3 Credits**

Study of Peninsular and Spanish-American literature from the 20th century to the present.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 393. Introduction to Translation and Interpretation****3 Credits**

General aspects of translation and interpretation from English to Spanish and Spanish to English. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 399. Independent Studies in Literature, Language, or Culture****1-3 Credits**

Individualized, self-paced projects for advanced students. Students must present formal proposal of study. May be repeated for a maximum of 6 credits.

**Prerequisite:** SPAN 312 and SPAN 313.

**SPAN 410. Mitos y Leyendas Indigenas****3 Credits**

Survey in Spanish language of indigenous poetry, myths and legends from Pre-Columbian times to present.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 411. Creative Writing****3 Credits**

Creative writing in Spanish.

**Prerequisite(s):** SPAN 314 or SPAN 315 and SPAN 380.

**SPAN 412. Spanish-American Poetry****3 Credits**

Study of major works by Spanish-American poets.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 415. Spanish-American Women Writers****3 Credits**

All genres of Spanish-American literature written by women.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 416. Nineteenth Century Spanish-American Literature****3 Credits**

Study of major works by Spanish-American authors of the 19th century.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 418. Spanish-American Short Story****3 Credits**

Study of major short stories by Spanish-American authors.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 419. Spanish American Drama****3 Credits**

Study of major works by Spanish-American dramatists.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 420. Hispanic Micro Fiction****3 Credits**

Study of micro fiction works by Hispanic Authors and creative writing workshop related to micro fiction.

**Prerequisite(s):** SPAN 314 or SPAN 315 and SPAN 380.

**SPAN 421. Culture and Literature of New Mexico**

**3 Credits**

The study of the development and flourishing of New Mexican culture and literature.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 422. Literature of the Mexican Revolution**

**3 Credits**

Study of Mexican authors dealing with the Mexican Revolution.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 424. Post-Modern Hispanic Literature**

**3 Credits**

The study of Post-Modern experimental literary genres, from Post-boom to the present.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 425. Conquest, Colonial and Indigenous Literatures**

**3 Credits**

The study of literary and cultural works of the Spaniard Conquest and Latin American Indigenous cultures.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 426. Spanish-American Novel**

**3 Credits**

Study of major works by Spanish-American novelists.

**Prerequisite:** SPAN 312 or SPAN 313.

**SPAN 427. Chicano Literature**

**3 Credits**

Study of Chicano/US-Mexican authors.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 439. Topics in Applied Spanish Linguistics**

**3 Credits**

Group study of selected topics to be identified by subtitle in the Schedule of Classes. May be repeated once under different subtitle for a maximum of 6 credits.

**Prerequisite:** SPAN 340.

**SPAN 447. Hispanic Film**

**3 Credits**

Study of major films from Spain and Spanish-America. Restricted to: Main campus only.

**SPAN 448. U.S.-Hispanic Film**

**3 Credits**

Study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

**SPAN 449. Special Problems**

**1-3 Credits**

Directed reading for graduate students in their specific fields to satisfy language requirement for master's or doctoral programs. May be repeated for a maximum of 6 credits.

**SPAN 450. Mexican Cultures**

**3 Credits**

Different aspects of Mexican Culture. Selected topic to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 6 credits under a different subtitle.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 451. Hispanic Cultures**

**3 Credits**

Issues in Hispanic cultures of the U.S., Spanish-America and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 457. Strategies for Teaching Spanish for Heritage/Native Speakers**

**3 Credits**

Overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers. Taught with SPAN 597.

**Prerequisite(s):** SPAN 314 or SPAN 315.

**SPAN 460. Spanish Language Acquisition**

**3 Credits**

Research and theories of acquisition of Spanish as a first or second language.

**Prerequisite:** LING 200 or SPAN 340, or consent of instructor.

**SPAN 461. Introduction to Spanish Phonetics**

**3 Credits**

An introduction to Spanish phonetics including basic dialectal variation and comparison with English.

**Prerequisite:** SPAN 340.

**SPAN 470. Methods for Teaching Literature to Spanish Heritage Learners**

**3 Credits**

Current methods for teaching literature to Spanish for Heritage Learners (SHL).

**Prerequisite(s):** SPAN 314 or SPAN 315 and SPAN 380.

**SPAN 490. Special Topics**

**3 Credits**

Selected topic to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

**Prerequisite(s):** SPAN 312 or SPAN 313.

**SPAN 491. History of the Spanish Language**

**3 Credits**

The development of Spanish from its origins.

**Prerequisite(s):** SPAN 340.

**SPAN 492. Structure of Spanish**

**3 Credits**

Topics in Spanish linguistics including phonology, morphology, syntax and semantics.

**Prerequisite(s):** SPAN 314 or SPAN 315 or SPAN 340.

**SPAN 493. Studies in U.S. Spanish**

**3 Credits**

Linguistic issues and studies of U.S. Spanish-speaking communities. Taught with SPAN 593.

**Prerequisite(s):** SPAN 340.

**SPAN 500. Methods of Research and Literary Criticism**

**3 Credits**

Advanced methods of research and literary criticism.

**SPAN 507. Technology Enhanced Language Learning**

**3 Credits**

Strategies for enhancing language learning with emerging technologies. Course is taught in Spanish.

**SPAN 508. Teaching Literature with Technology****3 Credits**

Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/  
**Prerequisite(s):** SPAN 507, and/or consent of instructor.

**SPAN 509. Teaching Culture with Technology****3 Credits**

Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/  
**Prerequisite(s):** SPAN 507, and/or consent of instructor.

**SPAN 510. Assessing the National Standards****3 Credits**

Analysis of the National Standards for Foreign Language Learning (the 5 Cs) in the 21st Century. Course will also cover the Integrated Performance Assessment as applied to the national standards. Other assessments will be reviewed to evaluate effectiveness in all levels of Spanish language classrooms.

**SPAN 512. Contemporary Spanish-American Poetry****3 Credits**

Readings and interpretation of Spanish-American poetry from the 20th century to the present.

**SPAN 520. Hispanic Micro Fiction****3 Credits**

Advanced study of micro fiction works by Hispanic Authors and creative writing workshop related to micro fiction.

**SPAN 521. Advanced Culture and Literature of New Mexico****3 Credits**

The advanced study of the development and flourishing of New Mexican culture and literature.

**SPAN 528. Advanced U.S. Latino Culture and Literature****3 Credits**

The advanced study of major works by Latino writers in the U.S.

**SPAN 540. Introduccion a la Linguistica****3 Credits**

Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change.

**Prerequisite(s):** Eligibility to take graduate level courses.

**SPAN 545. Advanced Dialectos del Espanol****3 Credits**

Advanced research of Spanish dialects including their formal characteristics, historical formation and regional variation.

**SPAN 547. Advanced Hispanic Film****3 Credits**

Advanced study of major films from Spain and Spanish-America.  
Restricted to: Main campus only.

**SPAN 548. Advanced U.S.-Hispanic Film****3 Credits**

Advanced study of major films about and/or by Hispanics of the U.S.  
Restricted to: Main campus only.

**SPAN 551. Advanced Hispanic Cultures****3 Credits**

Advanced study on Hispanic cultures of the U.S., Spanish-America and/or Spain. Selected topic to be identified by subtitle. Taught with SPAN 451.  
May be repeated up to 6 credits.

**SPAN 552. Advanced Literature of the Mexican Revolution****3 Credits**

Study of Mexican authors dealing with the Mexican Revolution.  
Restricted to: Main campus only.

**SPAN 555. Advanced Conquest, Colonial and Indigenous Literatures****3 Credits**

The advanced study of literary and cultural works of the Spaniard Conquest and Latin American Indigenous cultures.

**SPAN 556. Advanced 19-Century Spanish-American Literature****3 Credits**

Study of major works by Spanish-American authors of the 19th century.

**SPAN 558. Bilinguismo****3 Credits**

Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence.

**Prerequisite(s):** SPAN 540 or consent of instructor.

**SPAN 560. Advanced Spanish Language Acquisition****3 Credits**

Advanced research and theories of acquisition of Spanish as a first or second language.

**Prerequisite(s):** SPAN 540.

**SPAN 561. Advanced Spanish Phonetics****3 Credits**

Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.

**SPAN 562. Advanced Spanish Phonology****3 Credits**

An advanced formal examination of the sound system of Spanish including formal characterizations, dialectal variation and laboratory data.

**SPAN 563. Advanced Study in Mexican Literature****3 Credits**

Mexican literature from the Pre-Columbian period to the present.

**SPAN 564. Advanced Post-Modern Hispanic Literature****3 Credits**

The advanced study of Post-Modern experimental literary genres, from Post-boom to the present.

**SPAN 566. Contemporary Spanish-American Novel****3 Credits**

The Spanish-American novel from the 20th century to the present.

**SPAN 567. Advanced Study in Chicano Literature****3 Credits**

Study of all genres of Chicano literature.

**SPAN 570. Advanced Study in Technical Translation****3 Credits**

Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.

**SPAN 573. Advanced Study in Creative Writing****3 Credits**

Advanced creative writing in Spanish.

**SPAN 580. Research Methodology in Spanish Linguistics****3 Credits**

Study and practical application of techniques in linguistic research.

**SPAN 583. Advanced Study in Spanish-American Women Writers****3 Credits**

All genres of Spanish-American literature written by women. Research paper required.

**SPAN 584. Spanish Morphosyntax****3 Credits**

Examination of the morphological and syntactic structure of the Spanish language as well as their interaction. Practical applications are also explored.

**SPAN 585. Language Assessment****3 Credits**

Introduces students to theoretical principles of and analytical techniques for language assessment. Students will learn to critically analyze existing language assessment measures and will develop, pilot test and analyze measures of their own.

**Prerequisite(s):** SPAN 540 or SPAN 560 or SPAN 580 or consent of instructor.

**SPAN 586. Contemporary Spanish-American Essay****3 Credits**

Main currents in the Spanish-American thought from the 20th century to the present.

**SPAN 587. Contemporary Spanish-American Short Story****3 Credits**

The Spanish-American short story from the 20th century to the present.

**SPAN 588. Contemporary Spanish-American Drama****3 Credits**

The Spanish-American drama from the 20th century to the present.

**SPAN 589. Spanish Sociolinguistics****3 Credits**

Relationship between language and society in the Spanish-speaking world.

**SPAN 590. Advanced Special Topics****3 Credits (3)**

Specific subject to be announced in the Schedule of Classes. May be repeated up to 6 credits.

**SPAN 591. Advanced Study in History of the Spanish Language****3 Credits**

The development of Spanish from its origins.

**SPAN 592. Advanced Structure of Spanish****3 Credits**

Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.

**SPAN 594. Theory and Methodology of Spanish Pedagogy****3 Credits**

Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.

**SPAN 595. Advanced Topics in Applied Spanish Linguistics****3 Credits**

Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.

**SPAN 597. Advanced Strategies for Teaching Spanish for Heritage/Native Speakers****3 Credits**

Advanced overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers.

**SPAN 598. Independent Reading, Research, and/or Creative Writing****1-3 Credits**

Individual study of selected readings and problems; or individual research, either analytical or experimental, or creative writing. May be repeated for unlimited credits.

**SPAN 599. Master's Thesis****15 Credits**

Thesis.

## SPCD-ENGLISH AS A SECOND LNG (SPCD)

**SPCD 108. Intermediate ESL Listening and Speaking****3 Credits**

Development of listening and speaking skills with attention to pronunciation. Emphasis on conversation and oral practice appropriate to an academic setting. Graded S/U.

**Prerequisites:** placement based on English language screening test, and either a minimum TOEFL score of 500 or consent of instructor.

**SPCD 110. Intermediate ESL Composition and Grammar Review****3 Credits**

Development of fluent academic writing skills, with an emphasis on grammar review for editing purposes.

**Prerequisite(s):** Placement based on English language screening test, and either a minimum TOEFL score of 500 or consent of instructor.

**SPCD 111G. Advanced ESL Composition****4 Credits**

Academic writing, including library research papers and the issue of plagiarism, for students with nonnative English. (SPCD 111G is substituted for ENGL 111G for international students whose native language is not English.). Restricted to: Main campus only.

**Prerequisite(s):** Placement based on English language screening test, and either a minimum TOEFL score of 500 or consent of instructor; or successful completion of SPCD 110.

**SPCD 458. Advanced Speaking and Listening for International Graduate Students****3 Credits**

Advanced speaking and listening skills for active participation at the graduate level. Emphasis on pronunciation and individual goal setting. Includes a theoretical component involving library research or preparation and presentation of a teaching unit. Graded S/U, RR.

**Prerequisites:** placement and 530 TOEFL or consent of instructor.

**SPCD 470. Scholarly Writing for International Graduate Students****3 Credits**

Instruction and practice in writing major academic genres, including experimental, descriptive, and problem-solution research reports, proposals, and library referenced papers. Main campus only. Graded S/U.

**Prerequisites:** placement based on English language screening test or successful completion of SPCD 110; a minimum TOEFL score of 500 or consent of instructor; and successful completion of SPCD 108/490 where indicated by placement.

## SPED-SPECIAL EDUCATION (SPED)

**SPED 201. Topics****3 Credits**

Offered under various subtitles that indicate the subject matter to be covered. May be repeated 3 times for a maximum of 9 credits.

**SPED 202. Culture, Learning and Academic Achievement in a Diverse Society****3 Credits**

Development of culturally responsive learning strategies, skills and utilization of support services, to enhance academic achievement. Restricted to: Main campus only.

**SPED 210. Introduction to Special Education****3 Credits**

For paraprofessional students who will be working with a teacher in a Special Education classroom. This class will provide an overview of characteristics of children with special needs, legal issues, framework of effective instruction and a variety of practical teaching and learning strategies that are relevant to the tasks and academic demands required in inclusive classrooms.

**SPED 350. Introduction to Special Education in a Diverse Society****3 Credits**

Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners.

**SPED 355. Introduction to Bilingual/Multicultural Special Education****3 Credits**

Introduction to issues related to the provision of services to culturally and linguistically diverse students with exceptionalities. Same as BIL 355.

**SPED 360. Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society****3 Credits**

Curriculum theory and development for special education programs. Various teaching methods utilized with elementary exceptional learners and techniques involved in identifying, adapting, and developing materials will be addressed.

**SPED 406. High Incidence Disabilities in a Diverse Society****3 Credits**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders.

**SPED 407. Low Incidence Disabilities in a Diverse Society****3 Credits**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations.

**SPED 409. Reading for Elementary Exceptional Learners in a Diverse Society, K-6****3 Credits**

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 509.

**SPED 411. Reading for Elementary Exceptional Learners in a Diverse Society, 7-12****3 Credits**

Extends information covered in SPED 509, which covers grades K 6. Strategies and materials are addressed.

**SPED 450. Working with Young Children with Special Needs, Ages 3-8****3 Credits**

Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with SPED 550.

**Prerequisite(s):** SPED 350 or equivalent.

**SPED 451. Assessment of Young Children, Birth-Eight****3 Credits**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as SPED 551.

**Prerequisite:** SPED 450.

**SPED 452. Foundations of Visual Impairment****3 Credits**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. Taught with SPED 532 and SPED 632. Consent of Instructor required.

**SPED 453. Functional Implications of Low Vision****3 Credits**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Taught with SPED 533 and SPED 633.

**SPED 454. Strategies for Teaching Students with Visual and Multiple Impairments****3 Credits**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Taught with SPED 534 and SPED 634.

**Prerequisite(s):** SPED 453.

**SPED 455. Braille I: Literacy for Students with Visual Impairments****3 Credits**

This course facilitates an in-depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Taught with SPED 536 and SPED 636.

**SPED 457. Braille II: Literacy Skills for Students with Visual Impairments****3 Credits**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Taught with SPED 538 and SPED 638.

**Prerequisite(s):** SPED 455 or SPED 536 or SPED 636 or Consent of Instructor.

**SPED 459. Classroom Management for Diverse Learners****3 Credits**

Behavior-change strategies for exceptional learners.

**SPED 460. Strategies for Teaching Students with Visual Impairments  
3 Credits**

This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptations, IFSP/IEP/ITP planning, and evidence-based practices. Taught with SPED 539 and SPED 639. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 453, SPED 455, SPED 457 or Consent of Instructor.

**SPED 463. Introduction to Assessment of Diverse Exceptional Learners  
3 Credits**

Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs.

**SPED 470. Life Span Development and Transition in a Diverse Society  
3 Credits**

Special problems associated with transitions over the life span, with emphasis on adolescent and adult needs. Attention to service approaches for public schools, sheltered workshops, residential hospitals, and group homes.

**SPED 480. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society  
3 Credits**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 580.

**SPED 481. Practicum in Education, Equity and Cultural Diversity  
3 Credits**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. Restricted to: SPED majors.

**Prerequisite(s):** SPED 350 and SPED 360 or consent of instructor.

**SPED 482. Student Teaching SPED  
12 Credits**

Supervised teaching in a special education classroom and participation in a required seminar. Restricted to: SPED majors.

**Prerequisite(s):** SPED 481 and admission to student teaching.

**SPED 483. Early Childhood SPED Student Teaching  
6 Credits**

A student teaching experience designed for students studying early childhood special education. Restricted to majors. Same as SPED 583.

**Prerequisites:** Admission to student teaching.

**SPED 485. Introduction to Autism  
3 Credits**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 585 and SPED 685.

**SPED 486. Behavior and Autism  
3 Credits**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 586 and SPED 686 with differentiated assignments.

**Prerequisite(s)/Corequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 487. Social Skills and Autism  
3 Credits**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 587 and SPED 687 with differentiated assignments.

**Prerequisite(s)/Corequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 488. Communication and Autism  
3 Credits**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 588 and SPED 688 with differentiated assignments.

**Prerequisite(s):** SPED485 or SPED585 or SPED685.

**SPED 489. Topics  
3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated 3 times for a maximum of 9 credits.

**SPED 495. Directed Study courses in Special Education  
1-3 Credits**

Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits.

**SPED 500. Introduction to Special Education in a Diverse Society  
3 Credits**

This course introduces the field of special education to regular educators.

**SPED 501. Topics in Special Education  
1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 502. Problems  
1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 503. Contemporary Development  
1-3 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 504. Introduction to Assessment of Diverse Exceptional Learners  
3 Credits**

Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students. Crosslisted with: SPED 463. Restricted to: SPED majors.

**SPED 506. High Incidence Disabilities in a Diverse Society  
3 Credits**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders.

**SPED 507. Low Incidence Disabilities in a Diverse Society  
3 Credits**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 607 with differentiated assignments.

**SPED 508. Nature and Needs of Gifted Learners  
3 Credits (3)**

An introductory course in the education of gifted students. The course provides an overview of the current and historical issues in the field. The intellectual, social, emotional, development, and educational characteristics of gifted students are introduced. Appropriate educational opportunities and programming are discussed. Issues in identification of the gifted, special gifted populations, and current research are reviewed. Taught with SPED 608

**SPED 509. Reading for Elementary Exceptional Learners in a Diverse Society, K-6  
3 Credits**

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 409.

**SPED 510. Current Issues in Special Education for Teaching in Culturally Responsive Society  
3 Credits**

Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 610.

**SPED 511. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12  
3 Credits**

Extends information covered in SPED 509, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 411.

**SPED 512. Curriculum for Gifted Learners  
3 Credits (3)**

This course focuses upon the development of appropriate curriculum, courses, and units for gifted learners. Taught with SPED 612.

**SPED 513. Current Research in Special Education  
3 Credits**

Current investigations and research techniques.

**SPED 514. Twice Exceptional and Special Populations of Gifted Learners  
3 Credits (3)**

This course is designed for all professional personnel who work with students who are gifted. It focuses on special populations of gifted learners who possess unique characteristics and needs. Emphases are placed on issues related to the characteristics, identification, and development of appropriate educational services for twice exceptional and special populations of gifted learners. Taught with SPED 614

**SPED 516. Strategies for Teaching Gifted Learners  
3 Credits (3)**

This course comprehensively reviews teaching-learning models that can be used in the development and implementation of a curriculum for gifted students. The field of gifted education has seen new program models developed, more research accomplished, and new materials published, and this class examines these changes. Taught with SPED 616

**SPED 519. School Interventions and Organization in a Diverse Society  
3 Credits**

Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. Restricted to majors. Taught with SPED 619.

**SPED 520. Reading Disabilities Structure of Language  
3 Credits**

The purpose of this course is to introduce the student to the structure of language, including phonology, morphology, syntax, semantics, and to orthography. In addition, students in this course will study each area of language and able to use this information in analyzing the process of reading and writing.

**SPED 521. Intervention Techniques for Reading Disabilities  
3 Credits**

This course focuses on the systematic and explicit teaching of reading and writing skills. Included will be a summation of the most current reading research and its relevance to the field.

**SPED 522. Practicum in Reading Disabilities  
3 Credits**

Supervised experience in assessing a student with reading disability, developing and intervention plan, and implementing and monitoring the interventions across time.

**SPED 523. Advanced Curriculum for Diverse Exceptional Learners  
3 Credits**

Strategies for developing curricula appropriate to handicapped and gifted learners.

**Prerequisite:** SPED 360 or consent of instructor.

**SPED 532. Foundations of Visual Impairment  
3 Credits**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. Taught with SPED 452 and SPED 632 with differentiated assignment.

**SPED 533. Functional Implications of Low Vision  
3 Credits**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Taught with SPED 453 and SPED 633.

**SPED 534. Strategies for Teaching Students with Visual and Multisensory Impairments****3 Credits**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Taught with SPED 454 and SPED 634.

**Prerequisite(s):** SPED 533.

**SPED 536. Braille I: Literacy for Students with Visual Impairments****3 Credits**

This course facilitates an in depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Taught with SPED 455 and SPED 636.

**SPED 537. Independent Readings in Special Education****1-3 Credits**

Each course shall be identified by a qualifying subtitle. Maximum of 6 credits, 3 credits per semester.

**SPED 538. Braille II: Numeracy for Students with Visual Impairments****3 Credits**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Taught with SPED 457 and SPED 638 with differentiated assignments.

**Prerequisite(s):** SPED 455 or SPED 536 or SPED 636 consent of instructor.

**SPED 539. Strategies for Teaching Students with Visual Impairments****3 Credits**

This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptations, IFSP/IEP/ITP planning, and evidence-based practices. Taught with 460 and SPED 639. Restricted to: SPED majors.

**Prerequisite(s):** SPED 533, SPED 536, SPED 538.

**SPED 541. Assessment of Reading and Writing****3 Credits**

Differential diagnosis of reading and writing disabilities is the focus of this course. Students will develop competencies to diagnose different types of reading problems, including dyslexia. Students will be taught how accurate differential diagnosis leads directly to targeted intervention.

**SPED 545. Technology and Exceptionality in a Diverse Society****3 Credits**

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 645.

**SPED 548. Field Experience in Education, Equity & Cultural Diversity****3 Credits**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. This experience is designed for both the practicing general education classroom teacher pursuing special education licensure and for graduate teacher candidates pursuing initial special education licensure. Restricted to: SPED majors.

**Prerequisite(s):** SPED 350 and SPED 360, or SPED 500 and SPED 523, or consent of instructor.

**SPED 550. Working with Young Children with Special Needs, Ages 3-8****3 Credits**

Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Same as SPED 450 with differentiated assignments for graduate students. Same as ECED 550.

**Prerequisite:** SPED 500 or equivalent, or consent of instructor.

**SPED 551. Assessment of Young Children, Birth Eight****3 Credits**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as SPED 451.

**Prerequisite:** SPED 550 or consent of instructor.

**SPED 552. Introduction to Orientation and Mobility****3 Credits**

This course provides an overview of the history and theory of formalized orientation and mobility instruction as it relates to the ability to live independently. The impact of visual impairment and concomitant impairments on the development of spatial concepts and motor skills in relation to independent locomotion is emphasized. Topics covered include mobility aids; navigation, familiarization, and protective techniques; structured pre-cane assessment and instruction; the development and use of tactual maps; and the relationship of orientation and mobility to other areas of the expanded core curriculum. Consent of Instructor required. Restricted to: SPED, EDUC majors.

**SPED 553. Beginning Orientation and Mobility****3 Credits**

This course provides an overview of the profession of orientation and mobility and how sensory, motor, and psychosocial function affects movement and spatial orientation. Consent of Instructor required.

Restricted to: SPED majors.

**Prerequisite(s):** SPED 552.

**SPED 554. Intermediate Orientation and Mobility****3 Credits**

This course focuses on strategies and methods for conducting assessments and appropriately sequencing skill acquisition for learners across the lifespan who may or may not have additional disabilities. Adaptive technology and other aids that assist with travel in a variety of environmental conditions using different mobility systems will also be covered. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 553.

**SPED 555. Advanced Orientation and Mobility****3 Credits**

This course focuses on the development and monitoring of cane skills needed for safe and efficient travel in indoor, residential, and business districts, including the use of public transportation systems. Development, administration, and supervision of orientation and mobility services is also covered. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 554.

**SPED 559. Classroom Management for Diverse Learners****3 Credits**

Behavior-change strategies for exceptional learners. Taught with SPED 459 with differentiated assignments for graduate students.

**SPED 570. Life Span Development and Transition in a Diverse Society****3 Credits**

Covers special problems associated with transitions over the life span, with emphasis on adolescent and adult needs. Attention to service approaches for public schools, sheltered workshops, residential hospitals, and group homes. Taught with SPED 470.

**SPED 580. Curriculum, Methods, and Materials for Secondary Special Education****3 Credits**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 480.

**SPED 582. Student Teaching SPED****12 Credits**

Culminating course required for graduate level students seeking initial licensure. Restricted to: SPED majors.

**Prerequisite(s):** Bachelor s degree, SPED 548, and admission to student teaching.

**SPED 585. Introduction to Autism****3 Credits**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 485 and SPED 685. Differentiated Assignments.

**SPED 586. Behavior and Autism****3 Credits**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 486 and SPED 686 with differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 587. Social Skills and Autism****3 Credits**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 487 and SPED 687 with differentiated assignments.

**Prerequisite(s):** SPED 485or SPED 585 or SPED 685.

**SPED 588. Communication and Autism****3 Credits**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 488 and SPED 688 with differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 590. Masters Degree Seminar****3 Credits**

Capstone review of current issues in special education. Each student will participate in a practice comprehensive oral exam.

**SPED 598. Special Research Problems****1-3 Credits**

Individual investigation either analytical or experimental. May be repeated for a maximum of 6 credits, 3 credits per semester.

**SPED 599. Master's Thesis****15 Credits**

Thesis.

**SPED 600. Doctoral Research****1-15 Credits**

Research.

**SPED 605. Independent Study Topics in Special Education****1-6 Credits**

A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle.

**SPED 606. High Incidence Disabilities in a Diverse Society****3 Credits**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 506. Restricted to SPED and C D majors.

**Prerequisite:** Master's Degree.

**SPED 607. Low Incidence Disabilities****3 Credits**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 507 with differentiated assignments.

**SPED 608. Nature and Needs of Gifted Learners****3 Credits (3)**

An introductory course in the education of gifted students. The course provides an overview of the current and historical issues in the field. The intellectual, social, emotional, development, and educational characteristics of gifted students are introduced. Appropriate educational opportunities and programming are discussed. Issues in identification of the gifted, special gifted populations, and current research are reviewed. Taught with SPED 508

**SPED 610. Current Issues in Special Education for Teaching in a Culturally Responsive Society****3 Credits**

Required for students seeking the Ed.D./Ph.D. Taught with SPED 510.

**SPED 612. Curriculum for Gifted Learners****3 Credits (3)**

This course focuses upon the development of appropriate curriculum, courses, and units for gifted learners. Taught with SPED 512

**SPED 613. Current Research in Special Education****3 Credits**

Required for students seeking the Ed.D./Ph.D. Restricted to majors. Same as SPED 513.

**Prerequisite:** M.A. degree.

**SPED 614. Twice Exceptional and Special Populations of Gifted Learners****3 Credits (3)**

This course is designed for all professional personnel who work with students who are gifted. It focuses on special populations of gifted learners who possess unique characteristics and needs. Emphases are placed on issues related to the characteristics, identification, and development of appropriate educational services for twice exceptional and special populations of gifted learners. Taught with SPED 514

**SPED 616. Strategies for Teaching Gifted Learners****3 Credits (3)**

This course comprehensively reviews teaching-learning models that can be used in the development and implementation of a curriculum for gifted students. The field of gifted education has seen new program models developed, more research accomplished, and new materials published, and this class examines these changes. Taught with SPED 516.

**SPED 619. School Intervention and Organization in a Diverse Society****3 Credits**

Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. Restricted to majors. Taught with SPED 519.

**SPED 632. Foundations of Visual Impairment****3 Credits**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. Taught with SPED 452 and SPED 532.

**SPED 633. Functional Implications of Low Vision****3 Credits**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Taught with SPED 453 and SPED 533.

**SPED 634. Strategies for Teaching Students with Visual and Multiple Impairments****3 Credits**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Taught with SPED 454 and SPED 534.

**Prerequisite(s):** SPED 633.

**SPED 636. Braille I: Literacy for Students with Visual Impairments****3 Credits**

This course facilitates an in-depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Taught with SPED 455 and SPED 536.

**SPED 638. Braille II: Numeracy for Students with Visual Impairments****3 Credits**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Taught with SPED 457 and SPED 538.

**Prerequisite(s):** SPED 455 or SPED 536 or SPED 636.

**SPED 639. Strategies for Teaching Students with Visual Impairments****3 Credits**

This course covers assessment, curricular adaptation's, knowledge of transition age, young children with multiple disabilities, and assistive technology. Taught with SPED 460 and SPED 539. Consent of Instructor required. Restricted to: SPED majors.

**Prerequisite(s):** SPED 633, SPED 636, SPED 638 or Consent of Instructor.

**SPED 640. Internship in Special Education****1-6 Credits**

Each course bears a qualifying subtitle. Maximum of 6 credits per semester.

**SPED 645. Technology and Exceptionality in a Diverse Society****3 Credits**

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 545.

**SPED 662. Elementary Curriculum Methods and Materials for Special Education in a Diverse Society****3 Credits**

ESL and bilingual methods applied to bilingual exceptional students. Appropriate curriculum needs and materials development are also included. Taught with SPED 360, SPED 562.

**SPED 685. Introduction to Autism****3 Credits**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Differentiated Assignments. Taught with SPED 585 and SPED 485.

**SPED 686. Behavior and Autism****3 Credits**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 486 and SPED 586 with differentiated assignments.

**Prerequisite(s):** SPED485 or SPED585 or SPED685.

**SPED 687. Social Skills and Autism****3 Credits**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 487 and SPED 587 with differentiated assignments.

**Prerequisite(s)/Corequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 688. Communication and Autism****3 Credits**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 488 and SPED 588 and differentiated assignments.

**Prerequisite(s):** SPED 485 or SPED 585 or SPED 685.

**SPED 690. Doctoral Seminar****1-4 Credits (1-4)**

The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. Same as CD 690.

**SPED 698. Selected Topics in Special Education****1-6 Credits**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester.

**SPED 700. Dissertation****9 Credits**

Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated for a maximum of 24 credits. Restricted to majors.

## STAT-STATISTICS (STAT)

**STAT 251G. Statistics for Business and the Behavioral Sciences****3 Credits**

Techniques for describing and analyzing data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. Crosslisted with: A ST 251G.

**Prerequisite(s):** C- or better in MATH 120.

**STAT 271G. Statistics for Psychological Sciences****3 Credits**

Techniques for describing and analyzing data; basic concepts of statistical inference; estimation, hypothesis testing, correlation, and analysis of variance.

**Prerequisite(s):** C- or better in MATH 120.

**STAT 371. Statistics for Engineers and Scientists I****3 Credits**

Modern probability and statistics with applications to the engineering sciences.

**Prerequisite(s):** C - or better in MATH 192.

**STAT 400. Undergraduate Research****1-3 Credits**

Arrangements must be made with supervising professor before registration. May be repeated for a maximum of 6 credits.

**STAT 470. Probability: Theory and Applications****3 Credits**

Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.

**Prerequisite(s):** C- or better in MATH 291 and C- or better in at least one-300 level Math course.

**STAT 480. Statistics: Theory and Applications****3 Credits**

Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.

**Prerequisite(s):** C- or better in STAT 470.

**STAT 515. Probability: Theory and Applications****3 Credits**

Same as STAT 470 with additional work for graduate students.

**STAT 525. Statistics: Theory and Applications****3 Credits**

Same as STAT 480 with additional work for graduate students.

**STAT 535. Elementary Stochastic Processes****3 Credits**

Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.

**Prerequisite:** STAT 515 or consent of instructor.

**STAT 540. Directed Reading****1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor and graduate committee.

**STAT 562. Foundations of Probability****3 Credits**

Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.

**Prerequisite:** MATH 593.

**STAT 571. Continuous Multivariate Analysis****3 Credits**

Theory and applications of the multivariate normal distribution. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** STAT 525, or consent of instructor.

**STAT 572. Linear Models****3 Credits**

Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.

**Prerequisite(s):** STAT 571.

**STAT 581. Advanced Theory of Statistics I****3 Credits**

Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.

**Prerequisite:** STAT 525 or consent of instructor.

**STAT 582. Advanced Theory of Statistics II****3 Credits**

Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.

**Prerequisite:** STAT 581 or consent of instructor.

**STAT 598. Special Research Problems****1-3 Credits**

Individual investigations or consulting programs. Maximum of 3 credits.

## SUR-SURVEYING (SUR)

**SUR 101. Introduction to Surveying Engineering****1 Credit**

Review and discussion of career paths open to surveying engineers. Restricted to: Main campus only.

**SUR 201. GPS and Spatial Data Applications****3 Credits**

Overview of spatial data applications based on GPS observations. Emphasis on positioning and navigation using code-phase techniques with handheld receivers. Use of coordinate systems. Students encouraged to have their own GPS handheld unit.

**SUR 222. Plane Surveying****3 Credits (2+3P)**

Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping. May be repeated up to 3 credits. Crosslisted with: DRFT 222.

**Prerequisite(s):** MATH 190G.

**SUR 264. Introduction to LIS****3 Credits (2+3P)**

Introduction to land information systems. Land tenure systems, coordinate systems, computer methods. Pre/

**Corequisite(s):** DRFT 109.

**SUR 285. Precise Digital Mapping****3 Credits**

Perform basic photogrammetric mapping, and create digital terrain models. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** SUR 222 or DRFT 222.

**SUR 292. Public Land Survey System Boundaries****3 Credits (2+3P)**

Detailed study of the U.S. Public Land Survey System Instructions with special emphasis on New Mexico. Sectionalized land subdivision, corner restoration, and field surveys. Field trips required.

**Prerequisite:** SUR 222.

**SUR 312. Legal Principles and Boundary Law I****3 Credits**

Legal principles of property boundary retracement, and rights-of-way. Systems of law and legal research. Principles of the U.S. Public Land Survey System and manual of Instructions May be repeated up to 3 credits.

**Prerequisite(s):** SUR 222 or DRFT 222.

**SUR 322. Laser Scanning Mapping Technologies****3 Credits (2+2P)**

Perform basic terrestrial & airborne LiDAR scan, LiDAR Technologies and Applications will include ranging technologies such as LiDAR, SAR, and Bathymetry, point cloud data management & extraction, scan registration and processing

**Prerequisite(s):** SUR 285.

**SUR 328. Construction Surveying & Automation Technologies****3 Credits (2+3P)**

Construction Surveying Principles: conventional and machine controlled. Layout alignments, grades, various infrastructure, buildings. Understand error identification, common quality control checks and blunder identification. May be repeated up to 3 credits.

**Prerequisite(s):** (SUR 222 or DRFT 222) and (MATH 191G or MATH 235).

**SUR 330. Computer Applications of Surveying****3 Credits (2+3P)**

Advanced application of concepts and tools used in the manipulation of geospatial data in a computer environment. Topics include the use of surveying-specific software applications for problem solving, analysis and generation of spatial data products. Advanced programming skills in a high level language are presented and applied.

**Prerequisite(s):** DRFT 109 AND SUR 222, and ( MATH 191G or MATH 235) and (C S 187 or E T 262 or E E 161).

**SUR 351. Introductory Spatial Data Adjustment I****3 Credits**

Theory of random error in observations/measurements. Use of statistics in spatial data analysis, statistical testing, advanced data structures. Emphasis on computer based problem solving and programming to solve spatial data problems. May be repeated up to 3 credits.

**Prerequisite(s):** (SUR 222 or DRFT 222) and (MATH 191G or MATH 235) and (A ST 311G or STAT 251G) and (C S 151 or C S 152 or E T 262 or E E 161).

**SUR 361. Introduction to Geodesy/Geodetic Control Surveying****3 Credits (2+2P)**

Horizontal and vertical control network design and consideration. May be repeated up to 3 credits.

**Prerequisite(s):** (SUR 222 or DRFT 222) and (MATH 191G or MATH 235).

**SUR 370. Control Surveying****3 Credits (2+3P)**

Design and use of survey control networks. Includes Horizontal, Vertical and 3D networks. Use of standards in control surveying. History of control surveying.

**Prerequisite(s):** SUR 222 and (MATH 191G or MATH 235G).

**SUR 384. Surveying Practicum****1-3 Credits**

Surveying practice under the direction of a licensed, professional land surveyor requiring 45 hours per credit as per a plan worked out between the student and the surveyor and approved by the Surveying Engineering faculty. Work must be certified by the licensed, professional land surveyor. Requires a written report by the student.

**Prerequisites:** SUR 222 and junior standing.

**SUR 401. Ethics and Professionalism in Surveying and Mapping****3 Credits**

Ethics as applied to the surveying profession. Includes case studies and problems.

**Prerequisites:** SUR 312, SUR 328, and senior standing.

**SUR 412. Advanced Topics in Boundary Surveying****3 Credits (2+3P)**

Advanced land boundary topics including water boundaries, mineral claims, Spanish and Mexican land grants, state and national boundaries.

**Prerequisite:** SUR 312.

**SUR 450. Senior Project****1 Credit**

Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education.

**Prerequisite(s):** Senior Standing.

**SUR 451. Advanced Survey Measurements, Analysis, and Adjustments****3 Credits**

Rigorous analysis of the theory of observations as applied to spatial data, application of least squares adjustments, ability to perform statistical analysis to determine accuracy of final product, constrained/free geospatial data integration, error ellipses, and pre-analysis of spatial data acquisition procedures. May be repeated up to 3 credits.

**Prerequisite(s):** SUR 351, (MATH 280 or MATH 480).

**SUR 452. Spatial Data Integration and Analysis****3 Credits (2+2P)**

Methodologies of geospatial data acquisition and integration, knowledge of applications the source data is intended for, accuracies of acquired spatial data, types and analysis of coordinate transformation models. Integrating datasets for routing analysis, location study analysis, land management and long range plans as well as existing needs related to connectivity and safety. May be repeated up to 3 credits.

**Prerequisite(s):** SUR 451.

**SUR 461. GNSS Positioning****3 Credits (2+3P)**

Logistics of GNSS data collection, the GPS signal, codes and biases, error sources, differences between relative and autonomous GNSS positioning, code phase carrier phase, DGPS static and RTK surveys. Geodetic and GPS standards and specifications GNSS data processing, network adjustments, and evaluation of spatial data accuracy practical applications of GNSS May be repeated up to 3 credits.

**Prerequisite(s):** SUR 361.

**SUR 464. Legal Principles and Boundary Law II****3 Credits**

Concepts of real property, land tenure and ethics, and land registration systems; the function and design of multipurpose cadastre and land information systems. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** SUR 312.

**SUR 498. Emerging Technology in Geomatics****3 Credits**

Hydrographic/Bathymetric, Altimetry, Space borne Imaging Systems, Mobile Mapping Systems, Mining and Agriculture Surveying Principles, and advanced ranging data acquisition systems. May be repeated up to 3 credits. Consent of Instructor required.

**Prerequisite(s):** Consent of instructor and senior standing.

# SURG-SURGICAL TECHNOLOGY (SURG)

**SURG 120. Surgical Technology Clinical I****2-4 Credits**

This is a health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts.

This course is designed to prepare the student to enter the surgical environment. This course provides an introduction to the operating room, observation of surgical procedures, direct participation in the preoperative (pre-op, intra-op, post-op) preparation of individual cases and professional roles and responsibilities of individual members of the surgical team. Direct supervision is provided by the clinical professional. May be repeated up to 4 credits.

**Prerequisite(s):** Admission to Surgical Technology Program, BIOL 221, BIOL 225, BIOL 226, NURS 150.

**Corequisite(s):** SURG 140, SURG 145.

**SURG 140. Introduction to Surgical Technology****4 Credits**

This is an orientation to surgical technology theory, surgical pharmacology and anesthesia, technology sciences and patient care concepts and is designed to prepare the student to enter the surgical environment with entry-level knowledge necessary to understand patient responses to disease, illness, hospitalization, surgical procedures, commonly used pharmacological and anesthetic agents, and legal, moral, and ethical issues that could be encountered in the surgical environment. Restricted to Community Colleges campuses only.

**Prerequisite(s):** Admission to Surgical Technology Program; BIOL 221, BIOL 226, & NURS 150.

**SURG 145. Fundamentals of Perioperative Concepts & Techniques****4-5 Credits (3+3P)**

This is an in-depth coverage of perioperative concepts such as aseptic/sterile principles and practice, infectious processes, wound healing and creation and maintenance of the sterile field. This course is designed to prepare the student to enter the surgical environment with entry-level knowledge of aseptic technique principles and practices, the creation and maintenance of the sterile field including equipment, supplies and instrumentation, and basic case preparation and procedures. An introduction to diseases and disease processes that may be displayed by the surgical patient and the patient's bodily responses to disease are also included. May be repeated up to 5 credits.

**Prerequisite(s):** Admission to Surgical Technology Program, BIOL 221, BIOL 225, BIOL 226, & NURS 150.

**SURG 150. Surgical Procedures I****4-5 Credits (3-5+3P)**

This course is an introduction to surgical procedures and its related pathologies. Emphasis on surgical procedures related to general, obstetrics/gynecology, genitourinary, otorhinolaryngology and orthopedic surgical specialties incorporating instruments, equipment. It is designed to prepare the student to function actively in the surgical environment with entry-level knowledge of surgical procedures. This course expands the basic foundation principles and combines the study of common surgical procedures to include anatomy, physiology and pathophysiology. Specific patient care concepts, medications, instrumentation, equipment, supplies and complication related to selected surgical procedures will be discussed. Admission to Surgical Technology Program necessary to enroll in the course.

**Prerequisite(s):** SURG 140, SURG 145, and SURG 120.

**SURG 155. Pharmacology for the Surgical Technology****3 Credits**

This is an orientation to surgical pharmacology and anesthesia and is designed to prepare the student to enter the surgical environment with knowledge necessary to categorize the classification of drugs, calculate drug dosages and identify the therapeutic use, routes of administration, indications, contraindications and adverse effects of pharmacologic agents used in the perioperative setting. This course is the foundation for the acquisition of program specific competencies as identified by the AST Core Curriculum. Restricted to Carlsbad campus only.

**SURG 160. Surgical Procedures II****4 Credits**

This an introduction to surgical procedures and related pathologies. Emphasis on surgical procedures related to thoracic, peripheral vascular, plastic/reconstructive, ophthalmology, cardiac and neurological surgical specialties incorporating instruments. The course is designed to prepare the student to continue to function actively in the surgical environment with entry-level knowledge of more complex surgical procedures. This course expands the basic foundation principles and combines the study of complex surgical procedures to include anatomy, physiology, and pathophysiology. Specific patient care concepts, medications, instrumentation, equipment, supplies, and complications related to specific surgical procedures will be discussed. Realities of clinical practice and concepts of death and dying will also be discussed. Admission to Surgical Technology Program necessary to enroll in the course. Restricted to Community Colleges campuses only.

**Prerequisite(s):** SURG 150, SURG 260.

**SURG 230. Professional Readiness****2-3 Credits (2-3)**

This course transitions the student into professional readiness for employment, professional readiness for attaining certification and professional readiness for maintaining certification status. May be repeated up to 3 credits. Admission to Surgical Technology Program necessary to enroll in the course.

**Prerequisite(s):** SURG 140, SURG 145, SURG 120, SURG 150, SURG 260.

**Corequisite(s):** SURG 160, SURG 265.

**SURG 260. Surgical Technology Clinical II****4 Credits**

This is a health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts. Direct supervision is provided by the clinical professional. This course is designed to provide the student the opportunity to function actively in the role as a surgical technologist and health care team member in a clinical setting under the direct supervision of faculty and health care staff. Applications of basic principles and practices combined with a supervised clinical experience participating in common surgical procedures is the focus. Admission to Surgical Technology Program necessary to enroll in the course. Restricted to Community Colleges campuses only.

**Prerequisite(s):** SURG 120, SURG 140, & SURG 145.

**SURG 265. Surgical Technology Clinical III****3-7 Credits**

This is a health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts. This course is designed to provide the student the opportunity to function actively in the role of a surgical technologist and health care team member in a clinical setting under the direct supervision of faculty and health care staff. Refinement and application of basic principles and practices combined with entry-level employment competency expectations is the focus. Preparation for the National Certification Examination for Surgical Technologists is also included. May be repeated up to 7 credits. Admission to Surgical Technology Program necessary to enroll in the course.

**Prerequisite(s):** SURG 260.

## TCEN-ENVIRONMENTAL/ENERGY TECH (TCEN)

**TCEN 101. Energy for the Next Generation****3 Credits (2+2P)**

This course will survey a broad range of sources of energy, types of energy, energy storage, and the forms of energy. Students will be exposed to theory in the classroom, laboratory exercises, and field trips to provide them with a solid foundation for all subsequent energy related environmental courses. Crosslisted with: OETS 101.

**Prerequisite(s)/Corequisite(s):** OETS 118 or MATH 120. Restricted to: Community Colleges only.

**TCEN 105. Building Analyst I****3 Credits (2+2P)**

This course is designed to provide the foundational knowledge and expertise necessary for the energy auditor and home performance contractor. Crosslisted with: OETS 105. Restricted to: Community Colleges only.

**TCEN 106. Building Analyst II****3 Credits (2+2P)**

Designed to prepare the student for the BPI Building Analyst Certification. This course will walk the student through the hands-on process of conducting visual building inspections, diagnostic testing, identifying improvement opportunities, documenting a home's performance and preparing a scope of work. Crosslisted with: OETS106.

**Prerequisite(s)/Corequisite(s):** TCEN 105 or OETS 105. Restricted to: Community Colleges only.

**TCEN 110. Photovoltaic Application****4 Credits (3+2P)**

This course will provide an introduction to Photovoltaic (PV) installation. The course will provide instruction on site selection, prep, installation, and maintenance for photovoltaic applications. Students that complete the course and have the opportunity to take the entry level exam with the North American Board of Certified Energy Practitioners (NABCEP) en route to becoming Certified Installers. Crosslisted with: OETS110.

**Prerequisite(s)/Corequisite(s):** TCEN 101 or OETS 101. Restricted to: Community Colleges only.

**TCEN 111. Basic Electrical Principles I, DC Circuits****4 Credits (3+2P)**

Course begins with the basics of electricity and DC circuits. Includes categorization of material properties within conductors, semiconductors, and insulators. Gradual progression tackles more complex topics like DC circuit analysis of series and parallel circuits, including Kirchhoff's laws, Thevenin's & Norton's theorems, and superposition. Finally DC combination circuits, magnetism and electromagnetism, generators and motors are covered. Emphasis on safety throughout. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** OETS 104 or MATH 120. Restricted to Community Colleges campuses only.

**TCEN 112. PV Power Generation Design Fundamentals****3 Credits (2+2P)**

A study of photo voltaic design basics, photo voltaic (PV) Cells, modules, and system components; electrical circuits; grid-tied/grid-interactive PV system design and sizing for use on homes; solar electric products and applications; and understanding energy conversion from sunlight to electricity, and working with solar conversion equipment. Pre/ May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** TCEN 111 and (OETS 104 or MATH 120). Restricted to Community Colleges campuses only.

**TCEN 113. OSHA 10 Hour Construction Hazard Identifications****1 Credit**

Intended for entry-level participants to provide instruction on a variety of construction safety and health standards. Topics include Introduction to OSHA, Electrical, Ladder, Excavation, Scaffold, and Forklift Hazards, Fall Protection, Materials Handling, Personnel Protective Equipment and Confined Space Entry Hazards. Meets OSHA 10-Hour Requirements.

**TCEN 115. Wind Power Generation Design Fundamentals****3 Credits (2+2P)**

Course covers wind turbine module descriptions and functions and wind system installation, operation, and troubleshooting. Additional topics include wind energy harvesting and the conversion process from the generator system to electricity. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** TCEN 111 and (OETS 104 or MATH 120). Restricted to Community Colleges campuses only.

**TCEN 121. Basic Electrical Principles II, AC Circuits****4 Credits (3+2P)**

Course begins with an overview of the primary components of AC circuits, such as resistors, inductors, rectifiers, transformers and capacitors, and then gradually introduces new, more complicated topics like applying AC principles in power generation and generators, motors, parallel and combination circuits, troubleshooting and evaluation of circuit conditions. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** TCEN 111 and (OETS 104 or MATH 120). Restricted to Community Colleges campuses only.

**TCEN 130. Introduction to Biomass/Biogas****3 Credits (2+2P)**

Introduction to utilization of renewable biological wastes including crops for production of fuels. Anaerobic digester, gasification, pyrolysis, combustion and fermentation will be covered.

**Prerequisite(s)/Corequisite(s):** TCEN 101 or OETS 101. Restricted to: Community Colleges only.

**TCEN 140. Biofuel Science****3 Credits (2+2P)**

Fundamentals of basic organic chemistry and biochemistry applied to biofuel synthesis. Students will also be introduced to concept of conservation of matter and chemical reactions. Restricted to: Community Colleges only.

**TCEN 156. Building Envelope****3 Credits (2+2P)**

Designed to prepare the student for the BPI Building Envelope Certification. This course will provide the principles behind building performance testing and the purpose of completing a comprehensive energy audit. Through lecture and subsequent field training, the student will learn how to use building diagnostics to develop a prescriptive plan for enhancing comfort, health & safety, building durability, and energy savings. The student will learn how to outline the follow-up process required after completion of the retrofit. Crosslisted with: OETS156.

Restricted to: Community Colleges only.

**Prerequisite(s):** TCEN 106 or OETS 106.

**TCEN 180. Bio-diesel and Bio-ethanol Production****4 Credits (2+4P)**

Overview of the production of biofuels. Students will be introduced to current biofuel production processes, trans-esterification, hydrolysis and fermentation reactions, distillation, and laboratory synthesis of biofuels and engine performance tests. Restricted to: Community Colleges only.

**Prerequisite(s):** TCEN 140.

**TCEN 205. NEC for Alternative Energy****4 Credits (2+4P)**

This hands-on course will cover the National Electrical Code specifics concerning photovoltaic installation. Also code compliant wiring of basic electrical systems will be covered. Existing installations will be visited and studied. Restricted to: Community Colleges only.

**Prerequisite(s):** TCEN 101 and ELT 105.

**TCEN 210. Solar Thermal****4 Credits (2+4P)**

The purpose of this course is for students to learn to install solar thermal collectors for several applications, including domestic hot water, pool heating, and space heating. Students will be able to identify types of systems and components, adapt a system design, conduct a site assessment, install solar collectors, install components, install control systems, perform a system checkout, and maintain and troubleshoot a solar thermal system. Restricted to: Community Colleges only.

**Prerequisite(s):** TCEN 101 or OETS 101.

**TCEN 215. Fluid Thermal Systems****4 Credits (2+4P)**

Fluid properties and measurement, piping and tubing standards, pumps and operation. Restricted to: Community Colleges only.

**Prerequisite(s):** PHYS 110G or PHYS 211G.

**TCEN 220. Cooperative Experience****1-3 Credits (1-3)**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. May be repeated up to 6 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** MAT 235. Prerequisite(s): TCEN 180. Restricted to: TCEN majors. S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

**TCEN 221. Roofing Materials and Methods****3 Credits (2+2P)**

Covers application techniques and estimation of asphalt and wood roofing products and accessories including gutters and flashing. Presents roof penetration, roof loading issues, and energy system installation requirements for mounting photo voltaic or solar thermal systems.

**Prerequisite(s):** TCEN 112.

**TCEN 222. Photo Voltaic Grid Tie Installation****4 Credits (3+2P)**

This is a more advanced course culminating in a PV system-to-grid connection. This course includes gathering site specific data, design, wire type and sizing specific to project, installation of all solar modules and balance of system (BOS) components, and grounding and bonding of system components, all in accordance with the latest NEC. Upon project design approval a system will be commissioned for the grid. Decommissioning will commence after measurements and troubleshooting as directed by the instructor. May be repeated up to 4 credits.

**Prerequisite(s)/Corequisite(s):** TCEN 121 and TCEN 223. **Prerequisite(s):** TCEN 111 and TCEN 112. Restricted to Community Colleges campuses only.

**TCEN 223. Photo Voltaic National Electrical Code Principles****2 Credits (2+1P)**

Focuses on all sections of the National Electrical Code and local code requirements applicable to photo voltaic electrical installation. A partial list of areas covered is chapters one through four and section 690, "Solar Photovoltaic Systems" of the National Electrical Code. Pre/

**Prerequisite(s):** TCEN 112.

**Corequisite(s):** TCEN 222.

**TCEN 224. Field Experience****1-3 Credits (1-3)**

Student will collaborate with instructor in proposing, defining, implementing, and analyzing outcomes of a project in the Environmental and Energy fields of study. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: TCEN majors. Restricted to: Community Colleges only.

**TCEN 240. Renewables and Sustainability****3 Credits**

Various renewable energy technologies and sustainable design practices will be introduced. Restricted to: Community Colleges only.

**Prerequisite(s):** TCEN 101 or OETS 101.

**TCEN 241. Solar Thermal SHW Principles/Installation and Maintenance****3 Credits (2+2P)**

Course presents the theory, installation, operation, and maintenance of solar hot water (SHW) systems. Topics include the types of systems to choose, the costs associated with SHW installation and operation, system sizing requirements, batteries and battery chemistry. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** OETS 104 or MATH 120.

**TCEN 246. Building Weatherization & Auditor Fundamentals****3 Credits**

Course provides information on how to locate air leaks and identify heat losses or gains through specific testing. Students will learn how to inspect and evaluate building envelopes, mechanical systems, and ventilation systems to determine the safety and energy consumption for each system. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** TCEN 113 and OETS 104.

**Corequisite(s):** TCEN 221.

**TCEN 250. Photo Voltaic System Integrator Fundamentals****3 Credits**

Teaches the student project management fundamentals for working with homeowners, businesses, government, contractors, and manufacturers to design, build, and install complete alternative energy systems. Covers photovoltaic, small wind, and micro-hydro system designing, permitting, budgeting, and cost estimating requirements. Pre/

**Prerequisite(s):** E T 125.

**Corequisite(s):** TCEN 222.

**TCEN 251. Advanced Photo Voltaic On/Off Grid Installation****3 Credits (2+2P)**

Photo Voltaic advanced topics to include panel racking and installation, battery storage, charge controllers, mechanical integration of arrays on buildings, and key elements involved in choosing a mounting system. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** TCEN 222. Restricted to Community Colleges campuses only.

**TCEN 252. NABCEP Entry-Level Exam Review****1 Credit**

Course presents knowledge, key terms, and concepts of photovoltaic systems and solar hot water systems as related to the NABCEP Entry-level exam. This exam is for those wanting to enter the workforce in either solar thermal or solar PV. Scheduling and taking the exam is the responsibility of the student. May be repeated up to 1 credits. Consent of Instructor required.

**Prerequisite(s)/Corequisite(s):** TCEN 253. **Prerequisite(s):** TCEN 222.

Restricted to Community Colleges campuses only.

**TCEN 253. Renewable Energy System Troubleshooting and Maintenance****3 Credits (2+2P)**

Covers wind, solar and solar thermal system troubleshooting and maintenance topics to include equipment, electrical, and installation problem areas. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** TCEN 251. **Prerequisite(s):** TCEN 222.

Restricted to Community Colleges campuses only.

**TCEN 254. Renewable Energy Internship****2 Credits**

Student will receive industry-related renewable energy experiences at an approved industry location. Typical areas of hands-on practices will be installing solar PV, solar hot-water systems, or wind energy systems. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

**Prerequisite(s):** TCEN 112 and 113 and 222.

## THTR-THEATRE (THTR)

**THTR 101G. The World of Theatre****3 Credits**

An appreciation class introducing the non-major to all aspects of theatre, including its history, literature and professionals. Students attend and report on stage productions.

**THTR 105. Acting for Non-Majors****3 Credits**

An introduction to basic performance techniques for non-majors.

**THTR 110. Beginning Acting****3 Credits**

Basic understanding of self-expression through a variety of physical exercises, improvisation, and character study, culminating in scene or monologue work. Restricted to: THTR majors.

**THTR 120. Stage Movement****3 Credits**

Physical techniques for the actor to develop kinesthetic awareness and skills in characterization, archetypes, and stage combat. Restricted to: THTR majors.

**THTR 130. The Art of Theatre****3 Credits**

This course introduces the variety and scope of theatre professions, the value and goals of the theatre major and an analysis of the art form from script to stage. Restricted to: Required for THTR majors majors.

**THTR 141. Introduction to Stagecraft****3 Credits**

Basic techniques used in the construction of scenery, props, and sound. Lab required. Pre/

**Corequisite(s):** THTR 141L.

**THTR 141 L. Stagecraft Laboratory****1 Credit**

Class members will assist with construction for productions in a studio environment. Pre/

**Corequisite(s):** THTR 141.

**THTR 142. Introduction to Costume Crafts****3 Credits**

Common costume production techniques, including basic stitching, use of equipment, knowledge of available materials, dyeing, and 3-D.

**Prerequisite(s)/Corequisite(s):** THTR 142L. Restricted to: THTR majors.

**THTR 142 L. Costume Craft Lab****1 Credit**

Class members will assist in construction for productions in a studio environment. Pre/

**Corequisite(s):** THTR 142.

**THTR 149. Running Crew I****2 Credits (1+2P)**

Students learn about backstage and front of house production positions and work on a technical aspect of a production in a rehearsal and performance environment.

**THTR 200. Theatre Workshop I****0.5 Credits**

Required for all freshman and sophomore theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**THTR 210. Intermediate Acting: Scene Study and Monologues****3 Credits**

Monologues and scene work, using character and script analysis.

**Prerequisite(s)/Corequisite(s):** THTR 205. Prerequisite(s): THTR 110 with C- or above.

**THTR 220. Vocal Production for the Actor****3 Credits**

Exploration and development of the actor's vocal instrument, including relaxation, projection, diction and articulation. May be repeated up to 3 credits. Restricted to: THTR majors.

**THTR 222. Theatre Topics****1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

**THTR 249. Running Crew II****1 Credit**

Students work on a technical aspect of a production in a rehearsal and performance environment.

**THTR 250. Introduction to Design****3 Credits**

Introduction into our visual world via the language of designers, focusing on collaboration, creative thinking and presentation skills. The varied design professions in theatre and the performing arts will be explored. Restricted to: Required of all THTR Majors majors.

**THTR 300. Theatre Workshop II****0.5 Credits**

Required for all junior and senior theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

**THTR 303. Theatre History I****3 Credits**

History of theatre and drama from ancient Greece to the English Renaissance.

**THTR 304. Theatre History II****3 Credits**

History of theatre and drama from the Restoration to the 20th century. May be repeated up to 3 credits.

**THTR 306. Screenwriting I****3 Credits**

Same as CMI 309, ENGL 309. Consent of instructor required. Crosslisted with: CMI 309 and ENGL 309

**Prerequisite(s):** ENGL/CMI 235.

**THTR 307V. Society in Style: Fashion, History and Culture****3 Credits**

History of clothing for theatrical purposes, origins and evolution of period clothing in relation to social, political, and aesthetic factors of different periods.

**THTR 308. Creative Writing: Playwriting****3 Credits**

Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: ENGL 308

**Prerequisite(s):** ENGL 111G.

**THTR 310. Styles in Acting****3 Credits**

Analysis of differing styles of acting through scene work representing various time periods and genres.

**Prerequisite(s):** THTR 210.

**THTR 311. Acting for Film and Television****3 Credits**

Specific techniques of acting for the camera are explored via hands-on experiential learning and an introduction to the business of the TV/Film industry

**Prerequisite(s):** THTR 110 or THTR 105 or permission of instructor.

**THTR 312. Acting Shakespeare****3 Credits**

Acting Shakespeare's tragedies and comedies, including text work, scansion, movement, scene work, and monologues.

**Prerequisite(s):** THTR 210.

**THTR 313. Improvisation****3 Credits**

Long and/or short form improvisation techniques in addition to a variety of exercises exploring terminology, character work and the elements of comedy.

**Prerequisite(s):** THTR 105 or THTR 110.

**THTR 314. Scene Study****3 Credits**

Studio class focusing on scene work and acting processes.

**Prerequisite(s):** THTR 210.

**THTR 317. Musical Theatre****3 Credits**

Acting class focused on developing and refining skills necessary for performing in musicals. Pre/ May be repeated up to 9 credits.

**Prerequisite(s)/Corequisite(s):** THTR 210.

**THTR 320. Auditioning and Marketing****3 Credits**

Techniques for choosing and preparing effective monologues, cold and prepared readings, head shots and resumes, and interview skills.

**Prerequisite(s):** THTR 210.

**THTR 321V. Modern European Drama****3 Credits**

Masterworks of European drama from the 19th century to the present. Crosslisted with: ENGL321V.

**THTR 322. Dramatic Character****3 Credits**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. May be repeated up to 3 credits. Crosslisted with: ENGL 322.

**THTR 323. American Drama****3 Credits**

Masterworks of American drama from the 20th century to the present. Crosslisted with: ENGL323.

**THTR 329. Studies in Drama****3 Credits**

Subtitles vary. Study of a group of related works of drama, theory, or theatre practice. Crosslisted with: ENGL329 and CMI329.

**THTR 334. Introduction to Stage Makeup****3 Credits**

Basic principles of stage makeup: straight, character, and specialty. Includes study of various products, methods of application, and the effects of lighting on makeup.

**THTR 337. Independent Study****1-3 Credits**

Students propose and design their own course not covered through regular course offerings under the guidance of faculty. May be repeated up to 6 credits. Consent of Instructor required.

**THTR 341. Scene Painting****3 Credits**

Use of historical painting techniques in a project-driven classroom. Projects include 2-D and 3-D work, color mixing and theory, painting scenery, and the use of paint for effects.

**Prerequisite(s):** THTR 141.

**THTR 343. Costume Patterning****3 Credits**

Basic techniques in the production of flat patterns for modern and period silhouettes including some draping techniques. Consent of Instructor required.

**THTR 345. Costume Practicum****1 Credit**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Costume Shop. Pre/

**Corequisite(s):** THTR 142.

**THTR 346. Scenic Practicum****1 Credit**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Scene Shop. Pre/

**Corequisite(s):** THTR 141.

**THTR 347. Lighting Practicum****1 Credit**

A practical course intended to provide students hands-on experience executing theatrical lighting.

**THTR 348. Running Crew III****1 Credit**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

**Prerequisite(s):** THTR 149.

**THTR 349. Running Crew IV****1 Credit**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

**Prerequisite(s):** THTR 149.

**THTR 352. Costume Design****3 Credits**

Basic principles of costume design, including script analysis, principles of design, drawing and painting.

**THTR 353. Scene Design****3 Credits**

Design for the performing arts. Basic design skills and projects to exercise those skills, history of design in the theatre and the designer's role in the production process. Final project includes a finished scene design.

**Prerequisite:** THTR 141 or consent of instructor.

**THTR 354. Sound Design****3 Credits**

Hands-on training in theatrical sound design and implementation.

**THTR 355. Lighting Design****3 Credits**

Basic aspects of theatre lighting, including electricity, color theory, history, and types of lighting instruments.

**THTR 356. Theatre Production****1-3 Credits**

Participation in the production of theatrical performances by stage managing, acting, designing, dramaturgy, or directing. May be repeated for a maximum of 6 credits. Graded S/U.

**THTR 357. Computer Scenographics****3 Credits**

Project-oriented course teaching basic computer modeling skills. Projects focus on the creation of communication tools designers use in the theatrical process. Students will develop portfolios of completed projects. Consent of instructor required.

**Prerequisite(s):** THTR 352, THTR 353, or THTR 355.

**THTR 360. Creative Drama****3 Credits (2+2P)**

Methods of developing original dramatizations. Emphasis on curriculum problems and teaching techniques in elementary and secondary schools.

**THTR 366. Summer Theatre****1-3 Credits**

Experience in professional or academic summer theatre. May be repeated for a maximum of 3 credits. Graded: S/U. Restricted to THTR majors.

**Prerequisite(s):** Consent of department head.

**THTR 384. Stage Management****3 Credits**

Study of stage management techniques and their application to play production. A working knowledge of union rules, and the procedure to facilitate these through proper communication skills.

**THTR 395. Directing I****3 Credits**

Study and application of basic stage directing techniques.

**Prerequisite(s):** THTR 105 or THTR 110.

**THTR 396. Theatre Management****3 Credits**

Study of issues related to managing a theatre company and producing plays. May be repeated up to 3 credits.

**THTR 408. Shakespeare I****3 Credits**

Same as ENGL 408.

**THTR 409. Shakespeare II****3 Credits**

Same as ENGL 409.

**THTR 410. Advanced Acting: Contemporary Methods****3 Credits**

Acting techniques will be explored focusing on current trends in the profession, from Stanislavski, to Hagen to Meisner.

**Prerequisite(s):** THTR 205.

**THTR 414. Collaborative Theatre-Making****3 Credits**

This course introduces students to the techniques, skills and practice of the collaborative creation of new theatrical material.

**Prerequisite(s):** THTR 110.

**THTR 417. Musical Theatre II****3 Credits**

A continuation of THTR 317, allowing for more advanced musical theatre techniques.

**Prerequisite(s):** THTR 317.

**THTR 430. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

**THTR 435. Directed Reading****1-3 Credits**

Directed individualized studies. May be repeated for a maximum of 3 credits.

**THTR 439. Senior Seminar****3 Credits**

Course preparing students for professions in and related to the theatre. Restricted to: THTR majors.

**THTR 440. Senior Seminar Practicum****1 Credit**

Capstone course preparing students to apply knowledge of theatre arts toward advanced training or career objectives in the discipline. Consent of instructor required. Pre/ Restricted to THTR majors.

**Corequisite(s):** THTR 439.

**THTR 450. The Michael Chekhov Acting Intensive****3 Credits**

An intensive overview of the performance techniques attributed to Michael Chekhov, applied to theatrical scenes and presentations. May be repeated up to 6 credits. Consent of Instructor required.

**THTR 457. Advanced Computer Scenographics****3 Credits**

Project-oriented course for the advanced modeler. Projects focus on the creation of complex models, custom texturing and shading, virtual lighting, postproduction image work, and animation techniques. Students will develop digital portfolios.

**Prerequisite:** THTR 357 and consent of instructor.

**THTR 535. Directed Study****1-3 Credits (1-3)**

For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

## TOX-TOXICOLOGY (TOX)

**TOX 361. Basic Toxicology****3 Credits**

Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended. May be repeated up to 3 credits. Crosslisted with: E S 361.

**Prerequisite(s):** CHEM 112G or CHEM 110G.

**TOX 461. Toxicology I****3 Credits**

Introduction to principles of toxicology. May be repeated up to 3 credits.

**Prerequisite(s):** BIOL 111G or BIOL 211G.

**TOX 598. Special Research Programs****1-3 Credits**

Individual investigations, either analytical or experimental. Graded S/U.

## UNIV-UNIVERSITY STUDIES (UNIV)

### UNIV 101. Tutorial

#### 1-3 Credits

Development of specific skills required for college courses, such as note-taking, listening, and test-taking. To be taken in conjunction with a regular designated college course. May be repeated for a maximum of 3 credits. Graded S/U.

### UNIV 110. Personal Learning Skills I

#### 1-3 Credits

Individualized programs for self-improvement in skill areas necessary for academic success in the university environment. Each course to bear an appropriate subtitle. May be repeated up to 3 credits. Graded S/U.

### UNIV 112. Academic and Personal Effectiveness

#### 2 Credits

Learn academic self-analysis skills through the application of study and learning techniques to current course demands. Exposure to a variety of topics which enhance university and life-long learning.

### UNIV 113. Speed Reading

#### 1 Credit

Introduction to strategies and techniques for increasing reading rate and comprehension related to academic areas.

### UNIV 114. Financial Literacy Money Matters

#### 2 Credits

This course will cover a variety of financial literacy topics ranging from budgeting to student loan repayment. This course is designed to assist students in becoming more financially literate. Restricted to Las Cruces campus only.

### UNIV 115. Transition from Military to University

#### 2 Credits

Making a positive transition from military to civilian life is key to success. This course will cover a variety of topics ranging from time management to critical thinking. This course is designed to assist military and veteran students in becoming more effective learners through self-awareness, effectiveness study & learning strategies, and interpersonal skills. Skills and techniques for managing military to civilian readjustment transition issues are discussed and examined. Restricted to Las Cruces campus only.

### UNIV 116. Preparing for Cooperative Education & Internship

#### 1 Credit

The Cooperative Education Course provides students with a comprehensive overview of career-related topics designed to assist with securing Cooperative Education and Internship employment. Students learn about philosophies and approaches to resumes, cover letters, interviewing, job searching, networking, and professionalism. A primary focus of the course is on experiential learning where students have opportunities to practice and implement course concepts including interviewing, networking, job searching, and document creation. In addition to exploring topics related to Cooperative Education and Internship, the course is designed to provide students with tools and strategies for successfully navigating the transition from student to employee. S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

### UNIV 117. Diversity at the University

#### 1 Credit

In this course students will engage in discussions about diversity at the university, what it means in today's society and local community, and build on its complexity at NMSU. S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

### UNIV 118. Career Explorations and Planning

#### 1 Credit

This course is designed to increase the likelihood that individuals will successfully navigate the challenges they face when making college major and related career choices. Restricted to Las Cruces campus only.

### UNIV 150. The Freshman Year Experience

#### 3 Credits

An introduction to the university and its resources; emphasis on development of academic and personal skills that enable freshmen to become successful learners. Restricted to: Main campus only.

**Prerequisite(s):** Freshman Standing Only.

### UNIV 161. NMSU Gospel Choir

#### 1 Credit

Students will gain performance experience and exposure to urban contemporary gospel music. Open to all majors. May be taken for unlimited credit. Restricted to: Main campus only.

### UNIV 300. Preparing for the Graduate Record Examination

#### 1 Credit

Preparation for taking the Graduate Record Examination including review, test taking strategies and practice for the verbal, quantitative and analytical sections. Graded S/U.

### UNIV 350. Peer Education

#### 3 Credits

Overview of college student development theory and its application to college student learning and peer education. Supervised experience as a peer educator with training in structured group facilitation.

**Prerequisite:** consent of instructor.

### UNIV 361. NMSU Gospel Choir

#### 1 Credit

Students will gain performance experience and exposure to urban contemporary gospel music. Open to all majors. May be taken for unlimited credit.

### UNIV 395. Independent Study

#### 1-3 Credits

Individualized projects related to the field of learning assistance. May be repeated for a maximum of 3 credits.

### UNIV 495. Independant Study

#### 1-3 Credits (1-3)

Individualized projects related to the field of learning assistance. Taught with UNIV 395.

## W S-WOMEN'S STUDIES (W S)

### W S 201G. Introduction to Women s Studies

#### 3 Credits

Analysis of the status of women in society today and history and consequences of gender stratification and inequality from the perspectives of sociology, anthropology, psychology, political science, and other sciences.

### W S 202G. Representing Women Across Cultures

#### 3 Credits

Historical and critical examination of women's contributions to the humanities, with emphasis on the issues of representation that have contributed to exclusion and marginalization of women and their achievements. Crosslisted with: HON 218

**W S 316. History of Women in the American West****3 Credits**

Experiences and interactions among Native American, Spanish/Mexican, immigrant, and Anglo-American women in the American West from 1500 to the present. Same as HIST 316.

**W S 345. Victimology****3 Credits**

Same as C J 345.

**W S 350. Special Topics****3 Credits**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 300-level from any specific department. May be repeated under different subtitle(s).

**W S 359. Psychology of Gender****3 Credits**

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: PSY 359.

**Prerequisite(s):** PSY 201G.

**W S 360. Masculinities Studies****3 Credits**

Explores how contemporary American culture constructs manhood and masculinity. Interrogates ideas and enactments of masculinity, especially as they intersect with race/ethnicity, class, and sexuality. The class asks how sexuality, gender construction, and sex roles inform our understanding of masculinity, as well as how masculinity relates to social power.

**W S 380V. Women Writers****3 Credits**

Same as ENGL 380V.

**W S 381V. Women s Health Issues****3 Credits**

Same as HL S 380V.

**W S 382. Women in Mass Media****3 Credits**

Same as JOUR 380.

**W S 401. Women & Immigration****3 Credits (3)**

Explores historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

**W S 402. Transnational Feminisms****3 Credits (3)**

Explores dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

**W S 403. Gender & Horror****3 Credits (3)**

Explores cultural anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

**W S 404. Arab-Muslim Feminisms****3 Credits**

Develops a historical understanding of arab-muslim feminisms and homosexuality in Islam. Explores and uses critical feminist theories, language, and methods to counter interlocking discourses of Islamophobia, gendering, and homophobia affecting arab-muslim women.

**W S 405. Alternative Genders and Sexualities****3 Credits**

Introduces students to cultural study in the academic fields of Gay, Lesbian, Bisexual, Transgender (GLBT) and Queer Studies. Examines academic texts as well as literature and film from different historical moments and social/ global sites.

**W S 406. Women and Human Rights****3 Credits**

Analysis of human rights violations and injustices as they relate to the lives of girls and women. Examines international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, discusses social, political, economic, and human rights.

**W S 407. Gender and Graphic Narrative****3 Credits**

Examines graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

**W S 408. Food and Representation****3 Credits**

Examines contemporary food writing as a way to study identity, social structures, and notions of acceptability. Explores how constructions of food shape bodies, desires, and notions of belonging.

**W S 411. Gender and Migration****3 Credits**

Explores multiple experiences of forced migration and displacement. Examines violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

**W S 412. Gender and Film Studies****3 Credits**

Examines the shifting cultural and theoretical meanings of gender and sexuality across a variety of film genres while also analyzing the role of formal film elements in shaping representation and reception.

**W S 420. Girls, Women and Crime****3 Credits (3)**

Critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, W S majors. Crosslisted with: C J 420

**W S 433. Women, Gender, and Culture****3 Credits**

Same as ANTH 433.

**W S 450. Special Topics****3 Credits**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 400-level from any specific department. May be repeated under different subtitle(s).

**W S 451. Women's Studies Practicum****3 Credits**

Supervised field work in community setting relating to women. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**W S 453. Women and Politics****3 Credits**

Crosslisted with: GOVT 353

**W S 454. Women Crossing Borders****3 Credits**

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's Interactions across borders. Emphasis will vary with professor and discipline.

**W S 455. Feminist Research Methodologies****3 Credits**

Study of feminist methodologies, covering transnational decolonizing Indigenous, Chicana feminist approaches to research, such as storytelling, narrative, testimonio, platica, research-based art, performed ethnography and participatory action research. May be repeated up to 3 credits.

**W S 461. Women s Studies: Independent Study****3 Credits**

Individual study of selected topic and writing of research paper. May be repeated for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

**W S 465. Sex, Gender and the Body****3 Credits**

Examines forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

**Prerequisite(s):** None.

**W S 468. Global Sexualities****3 Credits**

Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with W S 568. Crosslisted with: SOC 468

**W S 471. Seminar in Feminist Theory****3 Credits**

Current feminist theory. Topic changes by semester. Course subtitled in the Schedule of Classes. Prerequisite: None

**W S 474. Gender in East Asian History****3 Credits**

Same as HIST 474.

**W S 482. Gender and Popular Culture****3 Credits**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 99 credits.

**W S 484. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

Crosslisted with: ENGL 481

**W S 501. Advanced Women & Immigration****3 Credits (3)**

Advanced exploration of historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

**W S 502. Advanced Transnational Feminisms****3 Credits (3)**

Advanced analysis of dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

**W S 503. Advanced Gender & Horror****3 Credits (3)**

Advanced analysis of anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

**W S 504. Advanced Arab-Muslim Feminisms****3 Credits**

Advanced study of historical and contemporary arab-muslim feminisms and homosexuality in Islam. Explores and uses critical feminist theories, language, and methods to counter interlocking discourses of Islamophobia, gendering, and homophobia affecting arab-muslim women.

**W S 505. Advanced Alternative Genders and Sexualities****3 Credits**

Advanced study of the academic fields of Gay, Lesbian, Bisexual, Transgender (GLBT) and Queer Studies. Examines academic texts as well as literature and film from different historical moments and social/ global sites.

**W S 506. Advanced Women and Human Rights****3 Credits**

Advanced analysis of human rights violations and injustices as they relate to the lives of girls and women. Intensive examination of international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, explores social, political, economic, and human rights.

**W S 507. Advanced Gender and Graphic Narrative****3 Credits**

Advanced examination of graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

**W S 508. Advanced Food Presentation****3 Credits**

Advanced examination of contemporary food writing as a way to study identity, social structures, and notions of acceptability. Intensive exploration of how constructions of food shape bodies, desires, and notions of belonging.

**W S 511. Advanced Gender and Migration****3 Credits**

Advanced exploration of multiple experiences of forced migration and displacement. Intensive examination of violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

**W S 512. Advanced Gender and Film Studies****3 Credits**

Advanced study of the shifting cultural and theoretical meanings of gender and sexuality across a variety of film genres while also analyzing the role of formal film elements in shaping representation and reception.

**W S 520. Advanced Girls, Women & Crime****3 Credits (3)**

Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Crosslisted with: C J 520

**W S 533. Advanced Issues in Women, Gender, and Culture****3 Credits**

Same as ANTH 533.

**W S 550. Special Topics****3 Credits**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 500-level from any specific department. May be repeated under different subtitle(s).

**W S 554. Advanced Issues in Women Crossing Borders****3 Credits**

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's interactions across borders.

**W S 555. Advanced Feminist Research Methodologies****3 Credits**

Advanced study of feminist methodologies, covering transnational decolonizing Indigenous, Chicana feminist approaches to research, such as storytelling, narrative, testimonio, plática, research-based art, performed ethnography and participatory action research. May be repeated up to 3 credits.

**W S 561. Independent Graduate Research in Women's Studies****3 Credits**

Individual study of selected topics and writing of a research paper. May be repeated for a maximum of 6 credits. Graded S/U.

**Prerequisite:** consent of instructor.

**W S 565. Advanced Sex, Gender & the Body****3 Credits (3)**

Advanced examination of forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

**W S 567. Global Sexualities****3 Credits**

Generates a global context to focus on sexual identity and orientation, sexual identity politics, romantic relationships, patterns of sexual behavior, sexual regulation and the impact of different cultures on individual sexualities. Taught with W S 468. Crosslisted with: SOC 568

**W S 571. Advanced Seminar in Feminist Theory****3 Credits**

Current feminist theory. Topic changes by semester. Course subtitled in the Schedule of Classes.

**W S 574. Gender in East Asian History****3 Credits**

Same as HIST 474 with differentiated assignments for graduate students. Required for graduate credit.

**W S 582. Gender and Popular Culture****3 Credits**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. Crosslisted with: ENGL 582

**W S 584. Women's Literature****3 Credits**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles. Crosslisted with: ENGL 581

## WATR-WATER UTILITIES (WATR)

**WATR 120. Introduction to Water Systems****3 Credits**

Introduction to and theory of groundwater sources, production, treatment, and distribution.

**WATR 130. Wastewater Collection and Basic Treatment Systems****3 Credits**

Introduction to wastewater characteristics, collection, and basic treatment operations.

**WATR 140. Applied Water and Wastewater Math I****3 Credits**

Introduction to basic water and wastewater mathematics, flows through distribution networks and collection systems, and fundamentals of flow measurement.

**Prerequisite:** CCDM 114 N or equivalent.

**WATR 160. Systems Maintenance****4 Credits (2+4P)**

Basic tools, equipment, maintenance schedules, chlorinator troubleshooting, and chlorine safety. Hands-on training with valves, pumps, meters and chlorination equipment.

**WATR 175. Programmable Logic Controllers****2 Credits**

This course will introduce students to electrical safety, theory, and the function, operations, programming and troubleshooting of the PLC controlling common electrical components utilized in control circuits associated with the water and wastewater industry. Restricted to: Community Colleges only.

**WATR 180. Water Chemistry****3 Credits**

Basic chemistry with applications to water and wastewater analysis.

**Prerequisite:** CCDM 114 N or consent of instructor.

**WATR 182. Water Chemistry Analysis****1 Credit**

Beginning water and wastewater laboratory analysis including gravimetric, volumetric, and quality control techniques.

**Prerequisite:** CCDM 114 N or equivalent or consent of instructor.

**WATR 190. Water and Wastewater Microbiology****3 Credits**

Overview of microorganisms associated with water and wastewater. Growth and reproduction, energy production, and methods of counting.

**Prerequisite:** WATR 130, WATR 180, or consent of instructor.

**WATR 192. Water and Wastewater Microbiological Analysis****1 Credit**

Introduction to water and wastewater treatment operational tests such as BODs, solids testing, activated sludge control tests, use of microscope, and bacteriological techniques.

**Prerequisites:** WATR 130 and WATR 182, or consent of instructor.

**WATR 200. Internship****3-5 Credits**

On-the-job training/work experience with municipalities or industries, working in water or wastewater treatment plants, high purity water plants, industrial waste plants, distribution systems, or wastewater collection systems. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: Water Technology majors. S/U Grading (S/U, Audit).

Restricted to Community Colleges campuses only.

**WATR 220. Water Treatment Systems****3 Credits**

Theory of water systems operation including surface water treatment, fluoridation, sodium zeolite softening, corrosion control, iron removal, various filtration methods, and overview of SDWA.

**Prerequisites:** WATR 180 and WATR 182 or consent of instructor.

**WATR 222. Water Systems Operation****1 Credit**

Operations of various water treatment systems including surface water treatment, sodium zeolite softeners, and various filtration methods.

**Prerequisite:** WATR 220 or consent of instructor.

**WATR 230. Advanced Wastewater Treatment****4 Credits**

Calculations and operations involved in wastewater and water reclamation plants.

**Prerequisites:** WATR 140, WATR 190, and WATR 192, or consent of instructor.

**WATR 232. Wastewater Systems Operations****1 Credit**

Operation of pretreatment, primary, and biological treatment units.

**Prerequisite:** WATR 230 or consent of instructor.

**WATR 240. Advanced Water and Wastewater Math II****3 Credits (2+2P)**

Advanced water and wastewater mathematics. Flow measurement.

Systems head and pump curves.

**Prerequisites:** WATR 140.

**WATR 250. Municipal Systems Management****4 Credits**

Management of water utility systems including laws, finance, records, and safety.

**Prerequisites:** WATR 120, WATR 130.

**WATR 255. Special Individualized Problems in Water Technology****1-4 Credits**

Individual studies in areas directly related to water technology.

**Prerequisite:** consent of instructor.

**WATR 270. Special Topics****1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

**WATR 275. Certification Review****3 Credits**

Review of water and wastewater plant operations and laws in preparation for state certification exams. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** WATR 120, WATR 130, WATR 140, WATR 160.

**WATR 285. High Purity Water Treatment Systems****3 Credits**

Principles of high purity water production including microfiltration, ultra-filtration, reverse osmosis, and deionization.

**Prerequisite:** WATR 220.

**WATR 287. Advanced Water Chemistry Analysis****3 Credits**

Sampling techniques, analysis, and evaluation of potable water contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods. May be repeated up to 3 credits.

**Prerequisite(s)/Corequisite(s):** Consent of instructor or WATR 285.

Restricted to Community Colleges campuses only.

**WATR 290. Advanced Wastewater Microbiology and Chemistry****3 Credits**

Covers NPDES permits and DMR calculations and reporting; 503 sludge regs, including pathogen and vector attraction reduction and pollutants; wetlands, composting, and wastewater treatment ponds microbiology; activated sludge bulking and foaming microbiology and treatment; and use of selector to remove nutrients and prevent the growth of filamentous bacteria.

**Prerequisite:** WATR 190, WATR 192.

**WATR 292. Advanced Wastewater Analysis****3 Credits**

Covers sampling techniques, analysis, and evaluation of wastewater contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods.

**Prerequisite:** WATR 190 and WATR 192.

## WELD-WELDING TECHNOLOGY (WELD)

**WELD 100. Structural Welding I****6 Credits (3+6P)**

Development of basic skills in SMAW, OFC, and OFW in accordance with the AWS entry-level welder program.

**WELD 101. Fundamentals of Welding****3 Credits**

Set-up and adjustment of ARC and oxyacetylene equipment. Welding safety procedures and terminology. Skill development in laying weld beads with various patterns, positions, and processes.

**WELD 102. Welding Fundamentals****3 Credits (2+2P)**

Survey of welding and cutting processes for nonmajors. Classroom instruction and laboratory work with OFC/OFW, SMAW, GMAW, FCAW, and plasma arc cutting.

**WELD 105. Introduction to Welding****3 Credits**

Welding practices, procedures, and terminology. Welding safety, equipment types, electrode types in usage, joint design and testing procedures.

**WELD 110. Blueprint Reading (Welding)****3 Credits**

Interpretation of prints related to welding. Emphasis on AWS standard symbols for welding, brazing, and nondestructive examination.

**WELD 112. Professional Development and Leadership****1 Credit**

As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing or participating in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: WELD majors. S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

**WELD 115. Structural Welding II****6 Credits (3+6P)**

Continuation of WELD 100. Emphasis on AWS entry and advanced level welder skills with SMAW, including all-position welding with mild and stainless steel electrodes. Plasma arc and air-carbon arc cutting, metallurgy, heat treatment, and weld defects.

**Prerequisite:** WELD 100.

**WELD 120. Basic Metallurgy****3 Credits**

Properties of ferrous and nonferrous materials. Service conditions and heat treatment of metals related to welding trade.

**Prerequisites:** WELD 100 or consent of instructor.

**WELD 125. Introduction to Pipe Welding****3 Credits (2+2P)**

Pipe fit-up and welding techniques for pipe fitting and pipe weld joint using SMAW, GMAW, GTAW, and FCAW, 2G welding of pipe. Restricted to: Community Colleges only.

**Prerequisite(s):** WELD 100, WELD 130, and WELD 140, or consent of instructor.

**WELD 126. Industrial Pipe Welding****3 Credits**

Enhancement of WELD 125. Development of more advanced pipe welding skills.

**Prerequisites:** WELD 110, WELD 130 and WELD 140.

**Corequisite:** WELD 125.

**WELD 130. Introduction to GMAW MIG****3 Credits (2+2P)**

Development of basic skills with gas metal arc welding (MIG) in accordance with AWS entry-level welder objectives. Wire electrodes, shielding/purge gases, and modes of metal transfer.

**WELD 140. Introduction to GTAW TIG****3 Credits (2+2P)**

Development for basic skills with gas tungsten arc welding (TIG) in accordance with AWS entry/advanced welder objectives. Welding mild steel, tungsten electrode preparation, filler wire selection, and equipment set-up.

**WELD 150. Pipe Welding II****3 Credits (2+2P)**

Continuation of WELD 125; with fillet and groove welded joints in a horizontal fixed and 45-degree fixed positions (5-F, 5-G, 6-F, 6-G).

**Prerequisite:** WELD 125.

**WELD 151. Industrial Pipe Welding II****3 Credits**

Enhancement of WELD 150. Development of more advanced pipe welding skills. Emphasis on industry driven test.

**Prerequisites:** WELD 125 and WELD 126.

**Corequisite:** WELD 150.

**WELD 160. Introduction to SAW and FCAW****3 Credits (2+2P)**

Submerged arc and flux-cored arc welding. Demonstrations and practice with machine travel submerged arc welding (SAW), flux-cored arc welding (FCAW-G, FCAW-S) on mild steel plate and pipe. Restricted to: Community Colleges only.

**WELD 170. Welded Fabrication****3 Credits (1+4P)**

Development of fabrication skills including basic layout, measuring, and utilization of various welding processes including out-of-position welding. Use of common shop tools.

**Prerequisites:** WELD 100, WELD 110, WELD 130, and OETS 104 or OETS 118.

**WELD 180. GTAW II****3 Credits (2+2P)**

Continuation of WELD 140. Development of more advanced GTAW skills. Emphasis on pipe welding with mild steel, stainless steel, and aluminum.

**Prerequisite:** WELD 140 or consent of instructor.

**WELD 190. Welded Art****3 Credits (1+4P)**

Students explore the possibilities of welded art in the form of sculpture, jewelry, furniture and as a framework to support other art media. Offered as an elective for students who wish to create art using welding. May be repeated up to 12 credits. Restricted to Community Colleges campuses only.

**Prerequisite(s):** WELD 102.

**WELD 205. Welding Equipment Maintenance****3 Credits (2+2P)**

Hands-on experience in the maintenance and repair of welding equipment, including welding machines and associate shop equipment, as well as the development of preventative maintenance programs. Basic safety, including MSDS and Right-to-Know will be introduced. Restricted to: Community Colleges only.

**Prerequisite(s):** WELD 100, WELD 130, WELD 140, WELD 160.

**WELD 211. Welder Qualification****6 Credits (3+6P)**

Laboratory and classroom instruction on AWS and ASME Welder Performance Qualification Tests. All position plate and pipe techniques and tests for SMAW, GMAW, GTAW, FCAW, and SAW. Nondestructive and destructive examination methods. Basics of welding codes. Restricted to majors.

**Prerequisites:** OETS 104 or OETS 118; and WELD 100, WELD 110, WELD 120, WELD 130, WELD 140, WELD 160 and WELD 180 or consent of instructor.

**WELD 221. Cooperative Experience I****1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U. Restricted to majors.

**Prerequisites:** WELD 100 or WELD 101 and consent of instructor.

**WELD 230. Weld Testing****3 Credits (2+2P)**

Covers destructive and nondestructive examination methods used to test welds. Tensile, compression, bend, hardness, impact, visual, dye-penetrant, magnetic particle, ultrasound, and radiographic methods of testing/examination. Restricted to: Community Colleges only.

**Prerequisite(s):** WELD 100, WELD 130, WELD 140, WELD 211, and OETS 104, or consent of instructor.

**WELD 255. Special Problems in Welding Technology****1-6 Credits**

Individual studies in areas of welding technology. May be repeated for a maximum of 12 credits.

**Prerequisite:** consent of instructor.

**WELD 295. Special Topics****1-4 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

## WERC-WASTE MGT EDU/RSRCH CONS (WERC)

**WERC 300. Introduction to Pollution Prevention and Its Application****3 Credits**

Investigates various approaches to industrial and domestic pollution prevention, waste minimization, and energy efficiency with emphasis on applications in the Southwest. Topics include: industrial case studies, energy conservation, environmental risk analysis, evaluating environmental performance, pollution prevention program development, training and education programs, funding sources, and economic impact.

**WERC 312. Emergency Response to Hazardous Material Incidents****2 Credits**

Same as E S 312, E T 312.

**WERC 330. Environmental Management Seminar I****1 Credit**

Survey of practical and new developments in environmental management field, hazardous and radioactive, waste management, energy, water, and related health issues, provided through a series of guest lectures and reports about on-going research. Restricted to: Main campus only.

Crosslisted with: C E 330, CH E 330, E E 330, E S 330, E T 330, I E 330 and M E 330

**WERC 381. Renewable Energy Technologies****3 Credits (2+3P)**

Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems. Crosslisted with: E T 381

**Prerequisite(s):** MATH 121G.

**WERC 384. Wind and Water Energy Technologies****3 Credits**

Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems. Same as E T 384.

**Prerequisite:** MATH 121G.

**WERC 386. Sustainable Construction and Green Building Design****3 Credits**

Sustainable Building materials, methods, and techniques including green architect and design, codes, standards and Specifications. Same as E T 386.

**Prerequisite:** MATH 121G.

**WERC 430. Environmental Management Seminar II****1 Credit**

Survey of practical and new developments in environmental management fields, hazardous and radioactive waste management, energy, water and related health issues, provided through a series of guest lectures and reports about ongoing research. Restricted to: Main campus only.

Crosslisted with: C E 430, CH E 430, E E 430, E S 430, E T 430, I E 430 and M E 430

**WERC 595. Special Topics****1-3 Credits**

Lecture instruction on special topics such as energy, environment and economics. May be taken for a maximum of 6 credits.

**Prerequisite:** consent of instructor.

## WSAM-WATER SCIENCE & MGT (WSAM)

**WSAM 470. Environmental Impacts of Land Use and Contaminant****Remediation****3 Credits**

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: E S 470.

**WSAM 589. Landscape Hydrology Modeling****3 Credits**

Understand the landscape scale of hydrologic cycle and related hydrological processes. Quantitatively evaluate hydrological system components. Retrieve, visualize and model some of the physical processes using some of the available tools. Consent of Instructor required.

**WSAM 599. Masters Thesis****1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits. Consent of Instructor required. Restricted to: Water and Science Management majors. Thesis/Dissertation Grading.

**WSAM 605. Arid Land Water Resources****3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. May be repeated up to 3 credits. Crosslisted with: E S 605.

**WSAM 610. Water and Sustainable Economic Development**

**3 Credits**

For graduate students in the Water Science and Management or other research degree programs, use the water economics literature as a model for student research leading to an M.S. thesis or Ph.D. dissertation.

**WSAM 700. Doctoral Dissertation**

**15 Credits (15)**

Dissertation for Water Sciences and Management Majors May be repeated up to 88 credits. Restricted to: Water Sciences and Management majors. Thesis/Dissertation Grading.

# INDEX

## A

A E-AEROSPACE ENGINEERING (A E) .....	679
A EN-AGRICULTURAL ENGINEERING (A EN) .....	680
A S-ARTS AND SCIENCES (A S) .....	680
A ST- APPLIED STATISTICS (A ST) .....	681
Academic Programs .....	51
Accounting - Bachelor of Accountancy .....	433
Accounting - Master of Accountancy .....	434
Accounting - Undergraduate Minor .....	433
Accounting and Information Systems .....	430
ACCT-ACCOUNTING (ACCT) .....	682
ACES-AGRI, CONSUMER & ENV SCIE (ACES) .....	684
Advertising - Undergraduate Minor .....	464
AEEC-AGRICULTURAL ECON/ECON (AEEC) .....	685
AERO-AEROSPACE STUDIES (AERO) .....	686
Aerospace Engineering - Bachelor of Science in Aerospace Engineering .....	635
Aerospace Engineering - Doctor of Philosophy .....	640
Aerospace Engineering - Master of Science in Aerospace Engineering .....	639
Aerospace Engineering - Undergraduate Minor .....	638
Aerospace Studies .....	181
Aerospace Studies - Undergraduate Minor .....	182
AERT-AEROSPACE TECHNOLOGY (AERT) .....	687
AG E-AGRICULTURAL ECONOMICS (AG E) .....	688
Agricultural and Community Development - Bachelor of Science in Agriculture .....	90
Agricultural and Extension Education .....	85
Agricultural and Extension Education - Bachelor of Science in Agriculture .....	90
Agricultural and Extension Education - Graduate Minor .....	91
Agricultural and Extension Education - Master of Arts .....	91
Agricultural and Extension Education - Undergraduate Minor .....	91
Agricultural and Natural Resource Leadership - Undergraduate Minor .....	91
Agricultural Biology - Bachelor of Science in Agriculture .....	118
Agricultural Biology - Master of Science .....	120
Agricultural Business Management- Undergraduate Minor .....	97
Agricultural Economics - Master of Science .....	99
Agricultural Economics and Agricultural Business .....	91
Agricultural Economics and Business - Bachelor of Science in Agriculture .....	96
Agricultural Engineering - Undergraduate Minor .....	577
Agriculture - Master of Agriculture .....	98
Agriculture - Master of Agriculture .....	111
Agriculture - Master of Business Administration .....	99
AGRO-AGRONOMY (AGRO) .....	690
Agronomy - Bachelor of Science in Agriculture .....	158
Agronomy - Undergraduate Minor .....	168
AHS-ALLIED HEALTH SCIENCE (AHS) .....	692
Alcohol Drug Counseling - Graduation Minor .....	671
Algorithm Theory - Undergraduate Minor .....	260
American Government and Politics - Undergraduate Minor .....	323
Animal and Range Sciences .....	100
Animal Science - Bachelor of Science in Agriculture .....	108
Animal Science - Doctor of Philosophy .....	113
Animal Science - Graduate Minor .....	114
Animal Science - Master of Science .....	112
Animation and Visual Effects - Bachelor of Creative Media .....	269
Animation and Visual Effects - Undergraduate Minor .....	271
ANSC-ANIMAL SCIENCE (ANSC) .....	693
ANTH-ANTHROPOLOGY (ANTH) .....	698
Anthropology .....	182
Anthropology - Bachelor of Arts .....	190
Anthropology - Graduate Minor .....	196
Anthropology - Master of Arts .....	194
Anthropology - Undergraduate Minor .....	192
Applied and Clinical Health Sciences .....	18
Applied Mathematics - Supplemental Major .....	373
Applied Social and Behavioral Sciences .....	18
Applied Statistics - Graduate Minor .....	177
Applied Statistics - Graduate Minor .....	450
Applied Statistics - Master of Science .....	448
Applied Studies - Bachelor of Applied Studies .....	341
Archaeology - Graduate Minor .....	196
ARCT-ARCHITECTURE (ARCT) .....	704
Areas of Interest .....	18
Art .....	197
Art - Bachelor of Arts .....	205
Art - Bachelor of Fine Arts .....	206
Art - Master of Arts .....	208
Art - Master of Fine Arts .....	208
Art - Undergraduate Minor .....	207
Art History - Undergraduate Minor .....	207
ART-ART (ART) .....	706
ASTR-ASTRONOMY (ASTR) .....	713
Astronomy .....	209

Astronomy - Doctor of Philosophy .....	214	CCDL-DEVELOPMENTAL ESL (CCDL) .....	767
Astronomy - Master of Science .....	214	CCDM-DEVELOPMENTAL MATHEMATICS (CCDM) .....	767
Astronomy - Undergraduate Minor .....	212	CCDR-DEVELOPMENTAL READING (CCDR) .....	767
Athletic Training - Bachelor of Science in Athletic Training .....	522	CCDS-DEVELOPMENTAL SKILLS (CCDS) .....	768
AUTO-AUTOMOTIVE TECHNOLOGY (AUTO) .....	715	CHEF-CULINARY ARTS (CHEF) .....	768
AXED-AGRICULTURAL EXTN EDUC (AXED) .....	717	CHEM-CHEMISTRY (CHEM) .....	770
<b>B</b>		Chemical & Materials Engineering .....	558
B A-BUSINESS ADMINISTRATION (B A) .....	721	Chemical Engineering - Bachelor of Science in Chemical Engineering ...	566
BCHE-BIOCHEMISTRY (BCHE) .....	722	Chemical Engineering - Doctor of Philosophy .....	569
BCIS-BUSINESS COMPUTER SYSTEMS (BCIS) .....	723	Chemical Engineering - Master of Science in Chemical Engineering .....	568
BCT-BUILDING CONSTRUCTION TECH (BCT) .....	725	Chemistry - Bachelor of Arts .....	238
BIL-BILINGUAL EDUCATION (BIL) .....	726	Chemistry - Bachelor of Science .....	238
Biochemistry - Bachelor of Science .....	237	Chemistry - Doctor of Philosophy .....	240
Biochemistry - Undergraduate Minor .....	239	Chemistry - Master of Science .....	240
Bioinformatics (with Computer Science) - Graduate Minor .....	382	Chemistry - Undergraduate Minor .....	239
Bioinformatics - Master of Science .....	261	Chemistry and Biochemistry .....	232
Bioinformatics - Undergraduate Minor .....	261	Chicano Studies - Supplementary Major .....	361
BIOL-BIOLOGY (BIOL) .....	727	Child Advocacy Studies (CAST) - Undergraduate Minor .....	136
Biology .....	214	Child Advocacy Studies - Undergraduate Minor .....	277
Biology - Bachelor of Arts .....	223	CHIN-CHINESE (CHIN) .....	773
Biology - Bachelor of Science .....	224	CHME-CHEMICAL & MATERIALS ENGR (CHME) .....	773
Biology - Doctor of Philosophy .....	231	CHSS - COMM HEALTH/SOC SRVCS (CHSS) .....	779
Biology - Master of Science .....	230	Civil Engineering .....	570
Biology - Undergraduate Minor .....	229	Civil Engineering - Bachelor of Science in Civil Engineering .....	575
Biomedical Engineering - Undergraduate Minor .....	567	Civil Engineering - Master of Science in Civil Engineering .....	577
BLAW-BUSINESS LAW (BLAW) .....	734	Clinical Mental Health Counseling - Master of Arts .....	478
BMGT-BUSINESS MANAGEMENT (BMGT) .....	735	Clinical Psychopharmacology - Master of Science .....	478
BOT-BUSINESS OFFICE TECHNOLOGY (BOT) .....	737	Clothing, Textiles and Fashion Merchandising - Bachelor of Science in Family and Consumer Sciences .....	130
Brewery Engineering- Undergraduate Minor .....	567	Clothing, Textiles and Fashion Merchandising - Undergraduate Minor ..	136
BUSA-BUSINESS ADMINISTRATION (BUSA) .....	740	CMI - CINEMA & FILM/VIDEO PROD (CMI) .....	779
Business .....	18	CMT-CREATIVE MEDIA TECHNOLOGY (CMT) .....	784
Business Administration .....	436	COLL-COLLEGE (COLL) .....	788
Business Administration - Doctor of Philosophy .....	439	College of Agricultural, Consumer, and Environmental Sciences .....	83
Business Administration - Master of Business Administration .....	437	College of Arts and Sciences .....	178
Business Law - Undergraduate Minor .....	454	College of Business .....	428
<b>C</b>		College of Education .....	465
C D-COMMUNICATION DISORDERS (C D) .....	740	College of Engineering .....	556
C E-CIVIL ENGINEERING (C E) .....	743	College of Health and Social Services .....	642
C EP-COUNSELING & EDUC PSY (C EP) .....	747	COMM-COMMUNICATION (COMM) .....	789
C J-CRIMINAL JUSTICE (C J) .....	754	Communication and National Security - Graduate Minor .....	246
C S-COMPUTER SCIENCE (C S) .....	759	Communication and National Security - Undergraduate Minor .....	245
CAST-CHILD ADVOCACY STUDIES (CAST) .....	766	Communication Disorders - Bachelor of Science in Education .....	544
CCDE-DEVELOPMENTAL ENGLISH (CCDE) .....	767		

Communication Disorders - Master of Arts .....	552	Dance - Bachelor of Arts in Dance .....	525
Communication Studies .....	240	Dance - Undergraduate Minor .....	532
Communication Studies - Bachelor of Arts .....	244	DAS-DENTAL ASSISTING (DAS) .....	799
Communication Studies - Graduate Minor .....	246	DHYG-DENTAL HYGIENE/HYGIENIST (DHYG) .....	800
Communication Studies - Master of Arts .....	245	Digital Communications - Graduate Certificate .....	595
Communication Studies - Undergraduate Minor .....	245	Digital Electronic Applications - Undergraduate Minor .....	621
Communication, Media Study, and Creative Arts .....	18	Digital Film Making - Bachelor of Creative Media .....	270
Comparative Politics - Undergraduate Minor .....	323	Digital Film Making - Undergraduate Minor .....	271
Computational Engineering- Undergraduate Minor .....	567	Digital Forensics - Undergraduate Minor .....	621
Computer Engineering - Undergraduate Minor .....	593	Digital Signal Processing - Graduate Certificate .....	595
Computer Science .....	246	DMS-DIAGNOSTIC MED SONOGRAPHY (DMS) .....	802
Computer Science - Bachelor of Arts .....	255	DRFT-DRAFTING (DRFT) .....	804
Computer Science - Bachelor of Science .....	257	<b>E</b>	
Computer Science - Bachelor of Science/Master of Science .....	259	E E-ELECTRICAL ENGINEERING (E E) .....	807
Computer Science - Doctor of Philosophy .....	263	E S-ENVIRONMENTAL SCIENCE (E S) .....	814
Computer Science - Graduate Minor .....	264	E T-ENGINEERING TECHNOLOGY (E T) .....	815
Computer Science - Master of Science .....	262	Early Childhood - Bachelor of Science in Education .....	490
Computer Systems - Undergraduate Minor .....	261	Early Childhood Education - Undergraduate Minor .....	498
Conservation Ecology - Bachelor in Conservation Ecology .....	225	ECDV-ECONOMIC DEVELOPMENT (ECDV) .....	821
Conservation Ecology - Bachelor of Science in Conservation Ecology ...	141	ECED-EARLY CHILDHOOD EDUCATION (ECED) .....	822
Conservation Ecology - Undergraduate Minor .....	145	ECON-ECONOMICS (ECON) .....	825
Conservation Ecology - Undergraduate Minor .....	229	Economic Development - Doctor of Economic Development .....	100
Counseling and Community Psychology - Bachelor of Science .....	476	Economics - Bachelor of Arts .....	282
Counseling and Educational Psychology .....	468	Economics - Bachelor of Arts in Economics .....	446
Counseling and Educational Psychology - Undergraduate Minor .....	478	Economics - Bachelor of Business Administration .....	446
Counseling Psychology - Doctor of Philosophy .....	479	Economics - Doctor of Economic Development .....	449
Course Listings .....	677	Economics - Graduate Minor .....	450
Creative Media .....	264	Economics - Master of Arts .....	448
Creative Writing - Master of Fine Arts in Creative Writing .....	301	Economics - Undergraduate Minor .....	282
Creative Writing - Undergraduate Minor .....	296	Economics - Undergraduate Minor .....	447
Criminal Justice .....	271	Economics, Applied Statistics, and International Business .....	280
Criminal Justice - Bachelor of Criminal Justice .....	276	Economics, Applied Statistics, and International Business .....	440
Criminal Justice - Master of Criminal Justice .....	279	EDLT-EDUCATION (EDLT) .....	827
CSEC-CYBERSECURITY (CSEC) .....	792	EDUC-EDUCATION (EDUC) .....	828
CTFM-CLTHNG/TXTLS/FSHN MRCHDSG (CTFM) .....	792	Education - Master of Arts .....	499
Culinary Science - Undergraduate Minor .....	136	Education - Master of Arts in Teaching .....	500
Cultural Resource Management - Graduate Certificate .....	195	Educational Administration - Graduate Minor (Doctoral) .....	509
Curriculum and Instruction .....	480	Educational Administration (Higher Ed)- Graduate Minor .....	509
Curriculum and Instruction - Doctor of Education .....	500	Educational Administration (Pk-12)- Graduate Minor .....	509
Curriculum and Instruction - Doctor of Philosophy .....	501	Educational Administration - Doctor of Education .....	508
<b>D</b>		Educational Administration - Doctor of Philosophy .....	508
Dairy Science- Undergraduate Minor .....	110	Educational Administration - Master of Arts .....	507
DANC-DANCE (DANC) .....	793	Educational Leadership and Administration .....	502

Educational Leadership and Administration - Undergraduate Minor .....	507	Essential Information for Students .....	20
ELA - EDUC LEADERSHIP & ADMIN (ELA) .....	833	Ethics - Undergraduate Minor .....	398
Electric Energy Systems - Graduate Certificate .....	596	Exercise Science - Undergraduate Minor .....	533
Electrical and Computer Engineering .....	580	<b>F</b>	
Electrical Engineering - Bachelor of Science in Electrical Engineering ...	590	Family and Child Science - Bachelor of Science in Family and Consumer Sciences .....	131
Electrical Engineering - Doctor of Philosophy .....	594	Family and Child Science - Undergraduate Minor .....	136
Electrical Engineering - Master of Science in Electrical Engineering .....	593	Family and Consumer Sciences .....	121
Electrical Engineering - Undergraduate Minor .....	593	Family and Consumer Sciences - Master of Science .....	136
Elementary Education - Bachelor of Science in Education .....	491	Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences .....	132
ELT - ELECTRONICS TECHNOLOGY (ELT) .....	837	Family Nurse Practitioner - Graduate Certificate .....	651
Engineering - Doctor of Philosophy .....	580	FCS-FAMILY AND CHILD SCIENCE (FCS) .....	851
Engineering - Doctor of Philosophy .....	628	FCSC-FAMILY & CONSUMER SCI (FCSC) .....	853
Engineering - Doctor of Philosophy .....	641	FCSE-FAMILY & CONSUMER SCI EDU (FCSE) .....	853
Engineering Physics .....	596	FIN-FINANCE (FIN) .....	854
Engineering Physics - Bachelor of Science in Engineering Physics .....	405	Finance .....	451
Engineering Physics - Bachelor of Science in Engineering Physics .....	601	Finance - Bachelor of Business Administration .....	453
Engineering Technology - Civil - Bachelor of Science in Engineering Technology .....	614	Finance - Graduate Certificate .....	456
Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology .....	615	Finance - Undergraduate Minor .....	455
Engineering Technology - Information - Bachelor of Science in Engineering Technology .....	617	Financial Aid & Scholarship Services .....	28
Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology .....	618	FIRE-FIRE INVESTIGATION (FIRE) .....	856
Engineering Technology and Surveying Engineering .....	605	Fish, Wildlife and Conservation Ecology .....	136
Engineering/MBA Program – Dual Degree .....	439	Fish, Wildlife and Conservation Ecology - Master of Science in Fish, Wildlife and Conservation Ecology .....	146
ENGL-ENGLISH (ENGL) .....	838	Fisheries and Wildlife Science - Bachelor of Science in Fish, Wildlife and Conservation Ecology .....	142
English .....	283	Food Science - Undergraduate Minor .....	136
English - Bachelor of Arts .....	293	Food Science and Technology - Bachelor of Science in Food Science and Technology .....	133
English - Master of Arts .....	299	Food Studies - Graduate Minor .....	196
English - Undergraduate Minor .....	297	Foreign Languages - Bachelor of Arts .....	358
ENGR-ENGINEERING (ENGR) .....	847	Forensic Science - Undergraduate Minor .....	278
Enterprise Systems - Undergraduate Minor .....	434	FREN-FRENCH (FREN) .....	858
Entomology - Undergraduate Minor .....	120	French - Undergraduate Minor .....	359
Entomology, Plant Pathology and Weed Science .....	115	FRMG-FAMILY RESOURCE MGT (FRMG) .....	859
ENTR-ENTREPRENEURSHIP AND INNOVATION .....	848	FSTE-FOOD SCIENCE & TECHNOLOGY (FSTE) .....	860
Entrepreneurship - Undergraduate Minor .....	628	FWCE-FISH,WILDLF,CONSERV ECOL (FWCE) .....	861
Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor .....	455	<b>G</b>	
ENVE-ENVIRONMENTAL ENGINEERING (ENVE) .....	848	G S-GRADUATE STUDIES (G S) .....	864
Environmental Chemistry - Undergraduate Minor .....	239	Gender and Sexuality Studies - Bachelor of Arts .....	342
Environmental Engineering - Master of Science in Environmental Engineering .....	579	Gender and Sexuality Studies - Undergraduate Minor .....	343
Environmental Science - Bachelor of Science in Environmental Science .....	159	Gender and Sexuality Studies -Graduate Minor .....	345
EPWS-ETMLGY/PLNT PTHLGY/WD SCI (EPWS) .....	849	GENE-GENETICS (GENE) .....	864
		General Agriculture .....	84

General Business - Bachelor of Business Administration .....	459	HON-HONORS (HON) .....	889
General Education Courses .....	46	Horse Management - Undergraduate Minor .....	110
Genetics and Biotechnology - Bachelor of Science in Genetics .....	159	HORT-HORTICULTURE (HORT) .....	893
Genetics and Biotechnology - Bachelor of Science in Genetics .....	226	Horticulture - Bachelor of Science in Agriculture .....	161
Genetics and Biotechnology - Undergraduate Minor .....	230	Horticulture - Master of Science .....	169
GEOG-GEOGRAPHY (GEOG) .....	865	Horticulture - Undergraduate Minor .....	168
Geographic Information Science and Technology (GIS&T) - Graduate Minor .....	177	HOST-HOSPITALITY AND TOURISM (HOST) .....	896
Geographic Information Systems - Graduate Minor .....	310	Hotel, Restaurant and Tourism Management - Bachelor of Science ....	172
Geographic Information Systems - Undergraduate Minor .....	309	Hotel, Restaurant and Tourism Management - Undergraduate Minor ....	173
Geography .....	302	HRTM-HOTEL/RESTRNT/TOURISM MGT (HRTM) .....	897
Geography - Bachelor of Science .....	307	Human Animal Interaction - Undergraduate Minor .....	110
Geography - Master of Applied Geography .....	309	Human Biology - Undergraduate Minor .....	230
Geography - Undergraduate Minor .....	309	Human Nutrition and Dietetic Sciences - Bachelor of Science in Family and Consumer Sciences .....	134
GEOL-GEOLOGY (GEOL) .....	869	Humanities and Social Sciences .....	18
Geological Sciences .....	310	HVAC-HEATING/AC/REFRIGERATION (HVAC) .....	900
Geology - Bachelor of Science .....	313	<b>I</b>	
Geology - Master of Science .....	316	I B-INTERNATIONAL BUSINESS (I B) .....	900
Geology - Undergraduate Minor .....	316	I E-INDUSTRIAL ENGINEERING (I E) .....	901
Geomatics - Bachelor of Science in Geomatics .....	619	ICT-INFO & COMMUNICATION TECH (ICT) .....	904
Geomatics - Undergraduate Minor .....	621	Individualized Studies - Bachelor of Individualized Studies .....	343
GER-GERMAN (GER) .....	871	Industrial Engineering .....	623
German - Undergraduate Minor .....	359	Industrial Engineering - Bachelor of Science in Industrial Engineering ...	627
GERO-GERONTOLOGY (GERO) .....	872	Industrial Engineering - Master of Science in Industrial Engineering ....	628
Gerontology - Undergraduate Minor .....	660	Information and Communication Technology - Bachelor of Information and Communication Technology .....	620
Government .....	316	Information Security Technology- Undergraduate Minor .....	622
Government - Bachelor of Arts .....	322	Information Systems - Bachelor of Business Administration .....	433
Government - Master of Arts .....	325	Information Systems - Graduate Minor .....	435
Government - Undergraduate Minor .....	324	Information Systems - Undergraduate Minor .....	434
GOVT-GOVERNMENT (GOVT) .....	872	INMT - INDUSTRIAL MAINTENANCE (INMT) .....	905
GPHY-GEOPHYSICS (GPHY) .....	877	Integrated Behavioral Health Care - Graduate Minor .....	479
GRAD CROSS UNIV EXCH (GREX) .....	877	Interdisciplinary Studies .....	337
Graduate Research Facilities .....	37	International Agricultural Development and Extension - Graduate Minor .	91
Graduation Requirements .....	51	International Business - Bachelor of Business Administration .....	447
<b>H</b>		International Business - Undergraduate Minor .....	447
HIST-HISTORY (HIST) .....	877	International Relations - Undergraduate Minor .....	324
History .....	327	International Studies - Undergraduate Minor .....	344
History - Bachelor of Arts .....	335	International Undergraduate Students .....	23
History - Graduate Minor .....	337	INTR-INTERDISCIPLINARY STUDIES .....	906
History - Master of Arts .....	336	<b>J</b>	
History - Undergraduate Minor .....	336	JOUR-JOURNALISM (JOUR) .....	906
HIT-HEALTH INFO TECHNOLOGY (HIT) .....	885	Journalism and Media Studies .....	345
HNDS-HUMAN NUTRITION & DIET (HNDS) .....	886	Journalism and Media Studies - Bachelor of Arts .....	347

Journalism and Media Studies - Undergraduate Minor .....	349	Mechanical Engineering - Bachelor of Science in Mechanical Engineering .....	637
JPNS-JAPANESE (JPNS) .....	908	Mechanical Engineering - Master of Science in Mechanical Engineering .....	640
<b>K</b>		Mechanical Engineering - Undergraduate Minor .....	639
Kinesiology - Bachelor of Science in Kinesiology .....	527	Mechanical Engineering and Aerospace Engineering .....	629
Kinesiology - Doctor of Philosophy .....	533	Medieval and Early Modern Studies - Undergraduate Minor .....	298
Kinesiology and Dance .....	509	MGT-MANAGEMENT (MGT) .....	924
<b>L</b>		Microbiology - Bachelor of Science .....	228
L SC-LIBRARY SCIENCE (L SC) .....	908	Microbiology - Undergraduate Minor .....	230
LANG-LANGUAGE (LANG) .....	911	Military and Veterans Programs (MVP) .....	43
Languages and Linguistics .....	349	Military Science .....	377
Las Cruces Academic Catalog .....	10	Military Science - Undergraduate Minor .....	379
Latin American Studies - Supplementary Major .....	360	MKTG-MARKETING (MKTG) .....	927
Law and Society - Supplemental Major .....	325	MOLB-MOLECULAR BIOLOGY (MOLB) .....	929
Law and Society - Undergraduate Supplemental Major .....	279	Molecular Biology .....	379
LAWE-LAW ENFORCEMENT (LAWE) .....	911	Molecular Biology - Doctor of Philosophy .....	381
LIB-LIBRARY SCIENCE (LIB) .....	912	Molecular Biology - Graduate Minor .....	382
Life Sciences .....	19	Molecular Biology - Master of Science .....	381
LING-LINGUISTICS (LING) .....	912	Molecular Biology - Undergraduate Minor .....	380
Linguistics - Supplementary Major .....	361	MPA-MA Public History Program - Dual Degree .....	326
Linguistics - Undergraduate Minor .....	359	MPA-MCJ Program - Dual Degree .....	326
Literature - Undergraduate Minor .....	297	MPH-MASTER OF PUBLIC HEALTH (MPH) .....	930
Livestock Production - Undergraduate Minor .....	111	MSW-SOCIAL WORK (MASTERS) (MSW) .....	932
<b>M</b>		MUS-MUSIC (MUS) .....	934
M E-MECHANICAL ENGINEERING (M E) .....	912	Museum Conservation - Undergraduate Minor .....	207
M SC-MILITARY SCIENCE (M SC) .....	916	Museum Studies - Graduate Certificate .....	195
Management .....	456	Music .....	382
Management - Bachelor of Business Administration .....	459	Music - Bachelor of Music .....	391
Management - Undergraduate Minor .....	460	Music - Master of Music .....	395
Manufacturing - Undergraduate Minor .....	622	Music - Undergraduate Minor .....	395
Marketing .....	461	Music Education - Bachelor of Music Education .....	393
Marketing - Bachelor of Business Administration .....	463	<b>N</b>	
Marketing - Undergraduate Minor .....	464	NA - NURSING ASSISTANT (NA) .....	941
Master of Public Health/Master of Social Work - Dual Degree .....	660	Native American Studies - Graduate Minor .....	197
Master of Social Work/Master of Public Health - Dual Degree .....	671	Native American Studies - Undergraduate Minor .....	192
MAT-AUTOMATION & MANUFACTURING (MAT) .....	918	Natural Resource Economics and Policy - Bachelor of Science in Agriculture .....	97
Materials Engineering - Graduate Minor .....	569	Natural Resource Economics- Undergraduate Minor .....	98
Materials Engineering - Undergraduate Minor .....	568	NAV-NAVAJO (NAV) .....	943
MATH-MATHEMATICS (MATH) .....	919	NMSU System Academic Regulations & Policies .....	53
Mathematical Sciences .....	363	Nuclear Chemical Engineering - Undergraduate Minor .....	568
Mathematics - Bachelor of Science .....	371	NURS-NURSING (NURS) .....	943
Mathematics - Doctor of Philosophy .....	375	Nursing .....	642
Mathematics - Master of Science .....	375		
Mathematics - Undergraduate Minor .....	374		

Nursing - Bachelor of Science in Nursing .....	652	Preprofessional Programs .....	51
Nursing - Doctor of Philosophy .....	653	Professional Selling - Undergraduate Minor .....	464
Nursing Administration - Master of Science in Nursing .....	653	Programs A-Z .....	13
Nursing Practice - Doctor of Nursing Practice .....	654	PSY-PSYCHOLOGY (PSY) .....	976
Nutrition - Undergraduate Minor .....	136	Psychiatric/Mental Health Nurse Practitioner - Graduate Certificate ....	652
<b>O</b>		Psychology .....	410
OEBM-BIOMEDICAL TECHNOLOGY (OEBM) .....	955	Psychology - Bachelor of Arts .....	414
OECS-COMPUTER TECHNOLOGY (OECS) .....	955	Psychology - Doctor of Philosophy .....	416
OEEM- PARAMEDIC (OEEM) .....	958	Psychology - Graduate Minor .....	417
OEET- ELECTRICAL TRADES (OEET) .....	961	Psychology - Master of Arts .....	415
OEGR-DIGITAL GRAPHIC TECH (OEGR) .....	962	Psychology - Undergraduate Minor .....	415
OEGS-GEOGRAPHIC INFO SYS (OEGS) .....	962	Public Administration - Master of Public Administration .....	326
OEPS-PUBLIC SAFETY (OEPS) .....	962	Public Administration - Undergraduate Minor .....	324
OEPT-PHOTOGRAPHIC TRADES (OEPT) .....	962	Public Health - Bachelor of Public Health .....	661
OETS-TECHNICAL STUDIES (OETS) .....	963	Public Health - Graduate Certificate .....	661
Online Teaching & Learning Technologies - Graduate Certificate .....	501	Public Health - Master of Public Health .....	662
<b>P</b>		Public Health Sciences .....	655
P E-PHYSICAL EDUCATION (P E) .....	963	Public Health Sciences - Undergraduate Minor .....	662
PE-P-PHYSICAL EDUCATION (PE P) .....	965	Public History and Public Administration - Dual M.A. Degree .....	337
Pest Management - Undergraduate Minor .....	120	Public Law - Undergraduate Minor .....	325
PHIL-PHILOSOPHY (PHIL) .....	966	Public Utility Regulation and Economics - Graduate Certificate .....	450
Philosophy .....	396	<b>R</b>	
Philosophy - Bachelor of Arts .....	398	RADT-RADIOLOGIC TECHNOLOGY (RADT) .....	979
Philosophy - Undergraduate Minor .....	398	Ranch Management - Undergraduate Minor .....	111
PHLS-PUBLIC HEALTH SCIENCES (PHLS) .....	967	Range Science - Bachelor of Science in Agriculture .....	109
PHYS-PHYSICS (PHYS) .....	970	Range Science - Doctor of Philosophy .....	114
Physical Sciences and Engineering .....	19	Range Science - Graduate Minor .....	115
Physics .....	399	Range Science - Master of Science .....	113
Physics - Bachelor of Arts .....	405	Range Science - Undergraduate Minor .....	111
Physics - Bachelor of Science .....	407	RDG-READING (RDG) .....	980
Physics - Doctor of Philosophy .....	409	Recognition of Academic Achievement .....	51
Physics - Graduate Minor .....	410	Registration .....	30
Physics - Master of Science .....	409	Religious Studies - Undergraduate Minor .....	193
Physics - Undergraduate Minor .....	408	Renewable Energy Technologies - Undergraduate Minor .....	622
PL-S-PARALEGAL SERVICES (PL S) .....	975	Resources for Students .....	30
Plant and Environmental Science - Doctor of Philosophy .....	169	RESP - RESPIRATORY THERAPY (RESP) .....	982
Plant and Environmental Science - Master of Science .....	169	RGSC-RANGE SCIENCE (RGSC) .....	983
Plant and Environmental Sciences .....	147	Rhetoric and Professional Communication - Doctor of Philosophy .....	301
Plant Pathology - Undergraduate Minor .....	120	Rhetoric and Professional Communication - Undergraduate Minor .....	299
Political Theory - Undergraduate Minor .....	324	Risk Management and Insurance - Undergraduate Minor .....	455
PORT-PORTUGUESE (PORT) .....	976	RXPP-PRESCRIP PRIV PRAC PSYCH (RXPP) .....	985
Pre-Law in Intellectual Property - Undergraduate Minor .....	568	<b>S</b>	
Pre-Medicine Studies- Undergraduate Minor .....	568	S WK-SOCIAL WORK (S WK) .....	987

School of Hotel, Restaurant and Tourism Management .....	169	The History of the University .....	12
School Psychology - Specialist in Education .....	479	The NMSU Community Colleges .....	676
Secondary Education - Bachelor of Science in Education .....	493	Theatre Arts .....	423
Security Studies - Graduate Minor .....	326	Theatre Arts - Bachelor of Arts .....	426
SMET-SCIENCE/MATH/ENG/TECH (SMET) .....	989	Theatre Arts - Undergraduate Minor .....	427
SOC-SOCIOLOGY (SOC) .....	989	THTR-THEATRE (THTR) .....	1016
Social Work .....	663	TOX-TOXICOLOGY (TOX) .....	1019
Social Work - Bachelor of Social Work .....	668	Transfer Undergraduate Students .....	22
Social Work - Master of Social Work .....	669	Tuition, Fees, and Other Expenses .....	26
Sociology .....	417	Turfgrass Science and Management - Bachelor of Science in Agriculture .....	166
Sociology - Bachelor of Arts .....	422	Turfgrass Science and Management - Undergraduate Minor .....	169
Sociology - Master of Arts .....	422	<b>U</b>	
Sociology - Undergraduate Minor .....	422	U.S.-Mexico Border Health Issues - Undergraduate Minor .....	663
Software Development - Undergraduate Minor .....	261	Undergraduate Admissions .....	20
Soil Science - Bachelor of Science in Agriculture .....	164	Undergraduate Honors College .....	672
Soil Science - Undergraduate Minor .....	168	UNIV-UNIVERSITY STUDIES (UNIV) .....	1020
SOIL-SOIL (SOIL) .....	993	University Leadership .....	11
SP M-SPORTS MEDICINE (SP M) .....	995	<b>W</b>	
SPAN-SPANISH (SPAN) .....	1000	W S-WOMEN'S STUDIES (W S) .....	1020
Spanish - Master of Arts .....	362	Water Science and Management .....	173
Spanish - Undergraduate Minor .....	360	Water Science and Management - Doctor of Philosophy .....	176
Spanish Counseling - Graduate Minor .....	479	Water Science and Management - Master of Science .....	176
SPCD-ENGLISH AS A SECOND LNG (SPCD) .....	1004	WATR-WATER UTILITIES (WATR) .....	1023
Special Education - Bachelor of Science in Education .....	546	Weed Science - Undergraduate Minor .....	120
Special Education - Doctor of Education .....	553	WELD-WELDING TECHNOLOGY (WELD) .....	1024
Special Education - Doctor of Philosophy .....	554	WERC-WASTE MGT EDU/RSRCH CONS (WERC) .....	1026
Special Education - Graduate Minor .....	555	Wildlife Science - Undergraduate Minor .....	146
Special Education - Master of Arts .....	552	Withdrawals .....	30
Special Education/Communication Disorders .....	534	WSAM-WATER SCIENCE & MGT (WSAM) .....	1026
SPED-SPECIAL EDUCATION (SPED) .....	1004	<b>Z</b>	
Sports Marketing - Undergraduate Minor .....	464	Zero-to-Four (Early Childhood)- Bachelor of Applied Studies .....	497
STAT-STATISTICS (STAT) .....	1011		
SUR-SURVEYING (SUR) .....	1012		
SURG-SURGICAL TECHNOLOGY (SURG) .....	1013		
Sustainability - Graduate Certificate .....	440		
Sustainability - Undergraduate Minor .....	460		
Sustainable Development - Undergraduate Minor .....	193		
Systems Engineering - Graduate Certificate .....	628		
<b>T</b>			
TCEN-ENVIRONMENTAL/ENERGY TECH (TCEN) .....	1014		
Teacher Education .....	19		
Telemetry - Graduate Certificate .....	596		
The Graduate School .....	76		